THE FUTURE OF INTERACTIVE ENTERTAINMENT

UK EDITION AUGUST 1998 £3.50 ¥2,100 ®

EDGE

PLAYSTATION ■ NINTENDO 64 ■ PC ■ DREAMCAST ■ SATURN ■ ARCADE ■ NUMEDIA



"I WANT A FERRARI FOR EVERY TOE I HAVE"

LIFE AFTER LARA

WHAT THE TOMB RAIDER CREW DID NEXT


TWO DOLLARS
UNITED STATES NOTE
TWO DOLLARS
A 21315217 A
WASHINGTON, D.C.
THIS NOTE IS A LEGAL TENDER
AT ITS FACE VALUE FOR ALL DEBTS
PUBLIC AND PRIVATE
A 21315217 A
TWO
THE
UNITED STATES OF AMERICA
WILL PAY TO THE BEARER ON DEMAND
TWO DOLLARS



Toby Gard jokes that he wants a Ferrari for each of his toes, harking back to the larger-than-life teenage programmers of the '80s. Ironically, **Edge** cover stars don't come much smaller than Gard and his associate Paul Douglas. As the creators of *Tomb Raider*, the pair can lay claim to fathering a modern icon, for helping to shift gaming into the mass market and for almost singlehandedly bankrolling Eidos for a year. And yet it's unlikely that even one per cent of **Edge** readers will recognise them.

The contrast between multi-million-selling game creators and the interchangeable ranks of musicians and actors who grace the newsstand each month couldn't be more acute. By striking out to set up Confounding Factor, Gard and Douglas join an exodus of star developers staking a claim for gaming talent. Of course, not everyone will be a cover star. But at least the trend might help more developers to make bold games like *Tomb Raider*, as opposed to being shackled to unimaginative sequels.

One of Gard's strengths – animation – is the subject of **Edge**'s main feature this issue. To hear people arguing over the sexiness of a videogame character like Lara Croft says more about how far games have come in recreating human beings than statistics on frames per second or hours of motion capture ever could. Just as animators are running up against the limits of keyframed animation, techniques like skeletal simulation promise to usher in a new era in realism. **Edge** examines the front-runners.

The differences between Toby Gard's original character, Lara Croft, and his latest, Rhama (above), represent three steady years of both technical progress and artistic evolution. The difference between placing Lara Croft on the cover of a videogames magazine or a picture of her creators represents a leap of faith.

Printed in the UK
© Future Publishing 1998
Voted magazine of the year
1997 InDin awards
ABC (Audit Bureau of Circulation)

Contacts

Editorial

Future Publishing
30 Monmouth Street
Bath, BANES BA1 2BW
Telephone: 01225 442244
Fax: 01225 732275
email: edge@futurenet.co.uk

Subscriptions

Future Publishing Ltd
FREEPOST BS4900, Somerton
Somerset TA11 7BR
Telephone Customer Services: 01225 822510
Telephone Customer order line: 01225 822511
Fax: 01458 274378
email: subs@futurenet.co.uk

People on Edge

Tony Mott editor
Owain Bennallack deputy editor
João Sanches reviews editor
Caspar Field writer
Jane Bentley production editor
Terry Stokes art editor
Darren Phillips art assistant
Nicolas di Costanzo Tokyo bureau

Cover: Confounding Factor's Toby Gard and Paul Douglas by Nick Wilson

Joanna Paget advertising manager
Tarik Browne classifieds
Jane Geddes recruitment 0171 447 3310
Advertising fax 0171 447 3399
Zöe Rogers production coordinator
Glenda Skidmore production manager
Production fax 01225 732293
Sarah Orchard ad design
Jeremy Fisher print services coordinator
Judith Green group prod manager
Andy Bodman pre-press services coordinator
Simon Windsor colour scanning
Mark Gover, **Jason Titley**,
Chris Power foreign licenses
Jackie Garford operational controller and promotions manager
Jane Ingham publishing director
Greg Ingham managing director

Colour reproduction

Colourworks Repro, Bristol
Phoenix Repro, Bath

Print

Cradley Print, Warley, West Midlands
Edge is printed on Royal Press 90gsm

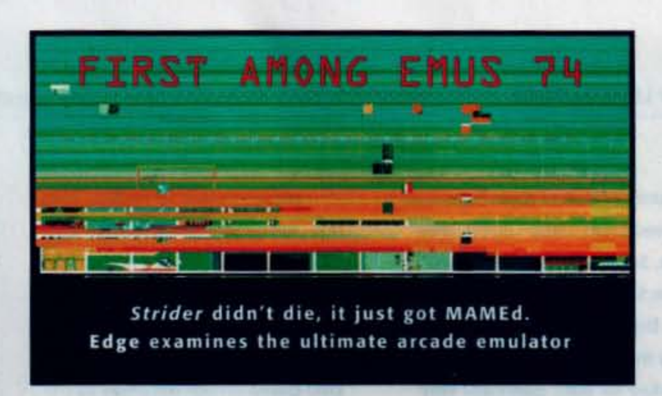
Production of Edge

Hardware Power Macintosh G3, PowerBook, Quadra by Apple
Software *QuarkXPress*, Adobe *Photoshop*, Macromedia *FreeHand*, Pixar *Typestry* and *Nisus*
Typography (Adobe®)
Formata light/**regular/medium/bold**
Vectora light/**bold/black** Base12Sons/**bold**/Univers Ultra Condensed
Fifth colours: Pantone® cover 375 / sections 8383/8302

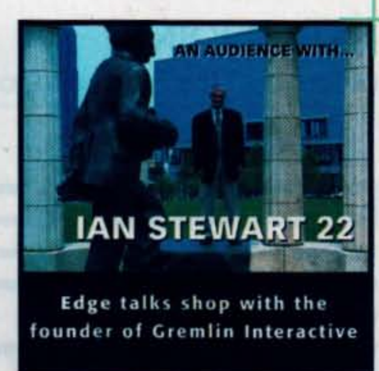
TESTSCREEN

The most honest, accurate videogame reviews in the world

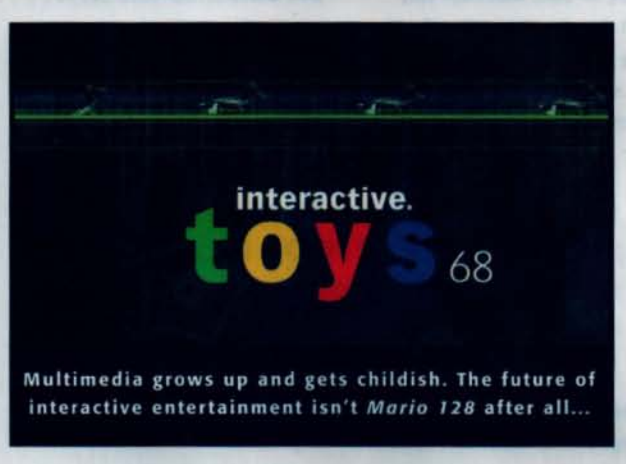




Strider didn't die, it just got MAMEd. Edge examines the ultimate arcade emulator



Edge talks shop with the founder of Gremlin Interactive



Multimedia grows up and gets childish. The future of interactive entertainment isn't *Mario 128* after all...

PRESCREENS 29

The N64 is coming back strong with *Jet Force Gemini, Castlevania 64, Wipeout 64* and, of course, *Zelda*



VIEWPOINT

EXPRESS YOURSELF IN **EDGE** – WRITE TO: LETTERS, **EDGE**, 30 MONMOUTH STREET, BATH, BA1 2BW (email: edge@futurenet.co.uk)

Your initial opinions regarding Dreamcast seem to be far more favourable than they were with the Saturn. However, in your articles you seem to be obsessed with whether the performance matches Model 3 or not.

This probably won't become apparent until finished software is available, and as of now Sega is confident that it outperforms Model 3. I'll take its word. You were right in your article to say that Dreamcast draws triangular polys, but if it does shift 3 million, which most developers say it does, it will be able to display 1.5 million squares. Considering Model 3 shifts in the region of 1 million squares, my bet is that Dreamcast is at least on a par with Model 3. If Sega can deliver the software, it should have a winner on its hands.

John Bright, via email

I wonder how much money Sega spent on the curly Dreamcast logo? There's a furniture/ornament store in Glasgow's west end called Evolution with exactly the same logo, except for different colours – orange on purple if my memory serves me right. Whatever Sega paid, I think it was too much!

Greig Chisholm, Glasgow

What is Sega doing with Dreamcast? I appreciate Saturn has failed, but is the time for a new console right? Why doesn't Sega learn to play its cards closer to its chest? We have been hearing rumours and reports about Dural/Katana for over two years now (just as we did with the Saturn), and all of them have proved pretty much correct. Nice one, Sega, what have we heard from Sony?

Does Sega think that if it is first into the market that it will win (that worked for 3DO, didn't it!)? Why hasn't Sega learnt from Sony? Surely it would have been been more sensible for Sega to develop in secrecy, wait to see what Sony had been doing, then beat it.

Sega should realise that 32bit gaming is reaching its peak (most Nintendo 64 and PlayStation owners having only brought their consoles within the last 18 months. The market will dry up just about in time for Sega to launch its console. I have read that Sega wants Dreamcast to be a mass-market proposition. Well, I hope it's planning to sell it for under £120 – but with a modem, 12x CD, PVRSG and natty LCD controllers, I can't see how.

I guarantee you 15 months from now, when Sega finally manages to deliver *Daytona 2*, *Sega Rally 2* and *Virtua Fighter 4*, that Sony will have stolen the show with a highly publicised announcement of a DVD-based system ten times as good looking as Sega's.

Nick Ralph, via email

The whole Dreamcast situation is an intriguing one, if only because Sega has so much to prove.

While polygon counts can make interesting reading, it's ultimately going to be software and marketing that will figure most prominently in its success or failure. Rest assured, **Edge** will be here to offer the most unbiased coverage of the format as it turns from dream to reality.

'Why hasn't Sega learnt from Sony? Surely it would be sensible for **Sega to develop in secrecy**, wait to see what Sony had been doing, then beat it. Sega should realise that **32bit gaming has peaked'**



After the past two years of a consistent and steady level of good software on the PlayStation, I find it terrible that the list of four games I earmarked for purchase this year has yet to be added to. While gamers will never buy every title released, the fact that my list has not been added to because of a lack of choice, rather than personal taste, is terrible.

As a devoted PlayStation owner, I find myself constantly questioning Sony's policy of flooding its platform with third-rate software. If the follow-up machine is to stand any chance of market domination or success, then Sony would do well to win the confidence and loyalty of the gaming community by sending the PlayStation out with a quality 'bang', rather than a splutter of rubbish. After all, consumers historically dislike a company that gives them the proverbial two fingers once the money has been made.

I hope a company with the clear perceptiveness of Sony will note the growing dissatisfaction in the ranks. I mean, come on, four games!

Richard Spooner, via email

Commiserations on your worst cover yet (E60). Absolutely atrocious. Are you worried that you aren't being noticed on the shelves? Happily, it was wrapped around an excellent issue. In these times of style over content, **Edge** is a joy.

Duncan McKenzie, via email

Your reviews of the pre-*FFVII* Playstation RPGs always compare them to older 16bit games that you seem to fondly remember. Not having been exposed to them and having enjoyed games such as *Suikoden* and *Vandal Hearts* a great deal, I thought I might investigate

further. I briefly dabbled in the twilight world of emulation but my ageing 486 just isn't up to task (even if it was, I prefer to get my RPG fix relaxing in a comfy chair in front of a console rather than hunched over a keyboard).

I was seriously thinking of upgrading my PC just so I could play the likes of *Chrono Trigger* and *FFV*, but once again the cost was prohibitive. Then I realised that for the price of a single PlayStation game I could buy a secondhand SNES with several games. This is quite amazing when you think about it. Square is about to release a port of the original SNES *Final Fantasy V* for the PlayStation and it will probably retail for more than the price of getting a secondhand SNES and cartridge.

Unfortunately, once again my plans have been foiled, as it appears very few of the great SNES RPGs were ever released on PAL.

Either way I think I'll go ahead and get a secondhand SNES. In recent editorials you've talked about the new mass-market consoles opening up the gaming industry to those who had not been exposed to it before. I think there might be a lot of recent converts like myself who are surprised by the quality and range of some SNES games.

When you consider just how cheap secondhand consoles are, compared to the price of N64 and Playstation games, it seems to me to be a pretty good purchase.

Ashley Wakeman,
via email

After playing the entire *Street Fighter* and *Tekken* series, I have to disagree with the comments Ross Thody made regarding the fighting genre. He has compared two styles of fighting games on one level, while there are many more to explore. Firstly, and I think most importantly, is the fact that the *Street Fighter* series is wholly 2D (and I include *Street Fighter EX*). This means that the programmers don't have to make adjustments for real-world physics. Characters move much faster than a human can, making for blisteringly fast and frenetic gameplay.

While this is a very good style, which lends itself well to an arcade scenario, in my humble opinion it is realism, not special effects, that make a fighting game. The *Tekken* series has this in abundance. From Lei's multiple fighting styles (all authentic kung-fu stances), to King's bone shattering throws, to Eddy's superbly realised Capoeria style, all of the characters move and fight as a real person would. Therefore the fights are more measured and calculated, calling for a certain degree of cool-headedness instead of frantic button-bashing.

Also, in *Tekken* it is almost impossible to predict what an opponent's first attacking move will be, which always adds an air of tension to the game. In *Street Fighter*, any competent player should be able to guess that the opponent is most likely to jump in with a heavy kick, use a fireball or a dragon punch-type manoeuvre. All the characters have the same basic fighting moves, and are therefore easy to predict. At the end of the day it all comes down to personal preference. I like *Tekken*, Ross Thody likes *Street Fighter*. I guess we can agree to disagree.

Chizo Ejindu,
via email

'Square is about to release a port of the original **Final Fantasy V for the PlayStation** and it will probably retail for more than the price of getting a **secondhand SNES** and cartridge'

You really are hypocritical and console-biased. Let's look at the facts...

Super Mario 64 – a stunning game, very well done. A real winner, and even I will say it's worth ten out of ten. *Gran Turismo* – a fine game, very good in fact. I have spent many hours playing it myself – ten out of out ten for 'redefining driving games'. Possibly a bit over-zealous on the marking, but I can live with it, as long as your scheme is consistent. *Unreal* – the most graphically stunning game *ever*. The most advanced monster intelligence *ever*. Incredible scale and level geometry – you cannot say it won't redefine 3D gaming forever. Eight out of ten? Your arguments for this are that it's 'too much like its competitors' and the 'the monster animation is not good enough'. Did you review it on a P60 or something? My 3Dfx-powered P200MMX has none of the aforementioned problems. I'm not sure what games you've been playing, but I've never seen anything like *Unreal*.

Maybe these things were ironed out before the final release.

Unreal changes its genre forever. You only need to look at the amount of gamers playing and the number of developers licensing the engine to see that. So why do they not get the coveted ten out of ten? Curious, isn't it?

Adam Wright,
via email

Some questions to consider:
1. Why in the past ten or so issues have you featured pictures of *Zelda* and constantly billed it up to be great when Nintendo can't even finish the title on time? Perfection is one thing but from the way it looks, I don't think it will ever be released.
2. Why do you always use your generic name in reviews, features and everything else you write?
3. Why have you persistently billed *GoldenEye* to be the best N64 game when it is an unimaginative *Doom/Quake/Duke Nukem* clone? I appreciate that refinement of certain genres is a good thing, but *GoldenEye* hardly pushes back the boundaries in firstperson shooters.

However, thanks for producing such a fantastic mag. Keep up the good work and all that.

Mark Waldron,
via email

Some answers:
1. Because, on the evidence to date, it might be bigger than *Super Mario 64*, the repercussions of which could seriously change the way videogames are designed.
2. That's just the way it is.
3. *GoldenEye* is *hardly* unimaginative. How many other firstperson shooters, even now, offer anything like its diversity? It remains a firm **Edge** favourite, over a year after its release.

Cutting Edge

The latest news from the world of interactive entertainment

DREAMCAST DEVELOPMENTS EMERGE

Sega's fresh platform is treated to a tentative embrace by the world's videogame makers















Sega has unveiled fresh shots of Dreamcast's VMS memory unit in use, both in and out of the new console's control pads. This odd *Godzilla* title is the first VMS title

In the wake of Sega's announcement of its new Dreamcast console, further details of planned development for the machine have been released. So far, over 1,000 dev kits have been shipped to over 120 developers worldwide, although Sega is asking to see game concepts prior to delivering the devices. In order to avoid a market swamped with B-grade titles, the company is aiming to eventually maintain a quality control system for Dreamcast. However, Sega's current threshold seems rather suspect – thirdparty games will only be rejected if they are deemed to contain 'socially unacceptable content', leaving the gates fairly wide open for whatever developers wish to throw through it. A position between Sony's software free-for-all and Nintendo's limited selection of titles would seem ideal for Sega.

Cautious comments

While rumours are rife on the Internet regarding possible Dreamcast titles, those actually confirmed as being in development remain members of an exclusive club. Of the companies **Edge** has contacted, most have reflected the cautious optimism voiced by Confounding Factor's **Toby Gard**. 'We only spoke to Sega recently,' he admits in this month's feature (see p50), 'but it's a really nice machine. We'll have to see.' His previous employer, Core Design, is also thought to have a Dreamcast title in the works, but has thus far refused to comment either way on the game's existence.

Surreal Software, the firm behind Psygnosis' forthcoming PC title *Drakan*, was recently quoted as expressing an interest in Sega's machine. However, while *Drakan*'s vast environments make it an ideal candidate for Dreamcast, Psygnosis' owner Sony may have a rather different opinion. Clearly, in relation to the western launch of the console it is still early days, with many European and American firms ready to do little more than express an interest. Contacting US Dreamcast developer GT Interactive revealed nothing other than the company line.

Meanwhile, NEC, partnered with VideoLogic in the production of the PowerVR Second Generation chipset, has two games underway for Sega. The first of these is an RPG, currently dubbed *Seventh Cross* and themed around evolution. Players must guide the initially simple character through its life, shaping its progression through interaction with the environment. NEC's second game is *Senngoku Turb*, intended to be a far more action-oriented experience although RPG elements are thought to feature.







NEC's two titles for the new Sega console are clearly a long way from completion. The highly colourful *Senngoku Turb* (main, centre) is oddly reminiscent of early PlayStation titles. *Seventh Cross* (right) looks curiously sparse

In the run up to the console's November 20 Japanese release date, Sega will host a number of events to promote its plans. September will see the second half of the 'Sega New Challenge Conference', a follow-up to the original announcement held on May 21. It will be at this gathering that Dreamcast's launch titles will be annouced, including which AM division games, such as *Virtua Fighter 3*, are on their way. (Sega now claims that one of the AM groups has achieved a polygon performance of almost four million flat-shaded triangles per second, although this has yet to be confirmed.) The following month, Sega will give members of the Japanese public their first chance to play Dreamcast titles, at the Tokyo Game Show. Expect **Edge** to beat the crowds and deliver regular updates between now and September.

Quick RAM fixes

Subsequent to last month's feature, a couple of added details regarding Dreamcast's technical specifications have been uncovered. While the machine's main memory is 16Mb, an additional 8Mb of VRAM (video memory) is also carried by the PowerVR Second Generation chipset. Additionally, while the console's modem is definitely to be included in Japanese machines, a decision has yet to be made regarding the European version.

Edge would certainly be highly disappointed by such a move, given the vast potential offered by the networking of Dreamcast. Hopefully, Sega will bite the bullet and reward patient European gamers with a fully enabled version of its potent new machine.







For those with a reasonably fast (and stable) Internet connection, it is now possible to view either AVI or Quicktime movies of the Iri-san Dreamcast demonstration software seen last issue. Log onto www.sega.co.jp/dreamcast/demo_iri.html to download the two parts

RAGE REVELATION

Rage Software has joined the growing ranks of Dreamcast developers. Just prior to **Edge**'s publication deadline, the company's director of marketing **Neil Critchlow** confirmed that, 'Rage Software is proud to be working on *Incoming* for the Dreamcast Japanese launch in November 1998.' He added that, 'We have the deepest respect for the company's [Sega] history and ability within both its hardware technology and software development businesses.'

The news that the well-received PC release *Incoming* will be a Japanese launch title is notable, not least for the game being of western origin. Further, it is the first game to publicly demonstrate Dreamcast's compatibility with Intel systems. Critchlow went on to say: 'Rage genuinely believes that Dreamcast technology is definitive second generation and therefore pledge our full support going forward.'

Edge contacted **Andy Williams**, technical director at Rage's Birmingham office, who was able to shed a little light on Dreamcast's current development kits. 'We have Step 2 now,' he explained, 'with the video chipset on. In the early days it emulated the video chip as well. They're expecting a five times increase in speed [over Step 1] for the real one.'

'The early board that we have is like an emulator. It's got the graphics chip on, but a lot of the other stuff is emulated with the processor. What it seems to be doing is when you compile, it generates normal Pentium code, and it runs that. So all they've given us is a videocard, basically.'

Williams was full of praise for Dreamcast: 'Technically, it's a very nice machine. If you were to give most programmers the choice between Dreamcast and PC, they'd go for Dreamcast... *Windows* is a nightmare.'

While Rage PC titles are of sufficent quality to represent a major announcement, other conversions to Dreamcast could be unwelcome. However, Williams feels that having a fixed target machine, as with Sega's console, will be a benefit. 'To write something sloppy takes half the time. When you only have one type of processor, you know how fast everything goes. And if someone else has made it go faster, then you make it go faster as well.'

Competition, as always, is a healthy thing indeed.



***Incoming* for Dreamcast should easily out-gun the PC version**

VIDEOGAMES TV CHANNEL FOR EUROPE

Infogrames and Canal + announce plans for Europe-wide videogames TV channel





CANAL+



Inspired by MTV, Infogrames is set to broadcast 24 hours a day

It would seem the ambition of **Bruno Bonnell** (above) knows no bounds. Not content with driving Infogrames hard towards the top of the publishing tree, he has announced his intention to back a Europe-wide videogames TV channel. He has signed a 'parity agreement' with French television group Canal +, which essentially means that Infogrames will be providing the financial backing for the project. However, Bonnell is keen to point out the independent nature of the new channel, claiming his main interest is purely in seeing it get off the ground. In a recent interview with *Computer Trade Weekly* he explained that, 'This industry deserves its own channel and we always thought that if no-one else created one, we would.'

Current plans are for the yet-to-be-named channel to launch this autumn, with the broadcasting rights for the UK likely to fall to satellite operator Sky. France is expected to receive the signal in September, with the remainder of Europe following shortly after. For the UK and other territories, the channel's content will either be dubbed or subtitled. The station will be funded through a combination of Infogrames' deep pockets, sponsorship and traditional advertising. Content will be sourced from across the continent, in order to maintain a pan-European feel.

Pop music channel MTV has clearly been an influence in the gestation of the videogames station. According to Infogrames UK's **Stephen Hey**, 'If we didn't see MTV as an inspiration then we'd be mad. However, the channel will be a completely different proposition. It will bring quality and innovation to television just like MTV did.' Content is expected to include news, previews, features and home shopping shows.

Although projected viewing figures aren't yet finalised, the new station's target audience has been identified. 'Target audiences will vary through the day,' reveals Hey. 'For instance, teatime programmes will be aimed at the 8-16 year-old post-school market, while 4-8 year-olds will have programming at breakfast time. The schedules will be carefully prepared to make sure that we target the correct audience, with relevant content, at the time of day they're most likely to be watching.'

Whether the imminent British digital television system will carry the new channel is undecided. However, according to **Bruno Delecour**, chairman of Canal Satellite, 'This agreement is a natural extension to the strategy pursued by Canal + in the multimedia, interactive system and digital technology fields.' Infogrames' £2 million investment should go some of the way towards making it happen.

MICROSOFT TALKS DIRECT

Bill Gates' behemoth finally gets DirectX on track

Microsoft is putting the finishing gloss on DirectX 6.0 and is nailing down the paper specification of DirectX 7.0. The company is so confident in DirectX 6.0's Direct3D API that it believes it could supplant specific 3D graphics accelerator APIs (such as 3Dfx's Glide) in the affections of the development community. And it has issued a challenge to developers: use DirectX 6.0 to create truly scaleable games.

Kevin Bachus, DirectX product manager at Microsoft, argues that Direct3D 6.0 supports all the features to be found in the latest generation of 3D graphics hardware, and more: 'We can deliver APIs at the same time as the hardware vendors and, in some cases, we're leading – for example, DirectX 6.0 has support for stencil planes, which hardware companies will be supporting next year. And take multi-texturing – future chips will be able to do two textures per polygon; DirectX 6.0 can support up to nine.'

He also maintains that developers will find DirectX 6.0 much easier to use: 'Developers have been frustrated by the long learning curve associated with Direct3D. In Direct3D 6.0, the sample code is focused on examples of discrete functionality – for example, we've included the source code to do bump-mapping. The samples are short, readable and can be used in shipping applications.'

Get off Spiral

Bachus believes that Direct3D 6.0 is good enough to release developers from the prevalent spiral of recreating their games for different 3D accelerator chips. This, he contends, will lead to increased game quality: 'I was speaking, for example, to Shiny's Dave Perry at E3, who was saying that the *MDK* team was ready to revolt because it was having to make versions for every chip under the sun.'

Besides, keeping track of every chip will certainly become increasingly difficult. 'At the end of the year, the hardware will be close to doing 10 million polygons per second, and next year, it'll go up to about 25 million,' says Bachus. 'One of the big challenges facing developers next year will be scaleability. For example, if you run *Tomb Raider II* on nVidia's Riva TNT, it looks exactly the same as on a Voodoo 1 chip. We're now reaching the point where scaleability of art assets, rather than throughput, is the most important thing.'

Developers will be able to see whether Bachus' confidence is justified when DirectX 6.0 ships in July. The only thing missing from the API set will be the new API DirectMusic, which will be present on the SDK as a beta and will ship in final form as part of DirectX 6.1 in the autumn.

The next DirectX

Microsoft is now consulting with hardware vendors and developers to set DirectX 7.0's specification. DirectX 7.0 will include the first stage of Fahrenheit, the new 3D model derived from OpenGL with Silicon Graphics' help

'DirectX 7.0 will have Fahrenheit's scene graph and large-model extensions APIs. The release will focus on better 3D, and improvements to DirectSound, DirectInput and DirectDraw,' reveals Bachus. 'For example, in DirectSound 7.0, you'll be able to create arbitrary loop points and the addition of time-stamp buffers will let you, say, play a certain sound plus 500ms. In Direct3D, we'll be looking to support quads and other higher-order surfaces, and there will be more complex multi-texturing capabilities.'

Bachus says games development will soon reach a point where the hardware is so fast that polygons start to near pixel levels. At this point, developers might abandon polygons in favour of higher-order surfaces.

'People are using quads and NURBs now, but I think there'll be at least one more generation of games that use standard polygons. We may do things in DirectX 7.0 which jump-start this change, but it's hard to say what. Part of the problem is that NURBs, in particular, are not well understood by most programmers. There are some fantastic effects you can get with higher-order surfaces, but it's not like you'll be able to do things you can't do to the same extent polygonally.'

Bachus's line is that DirectX will make change easier, not harder, for developers to cope with. **Edge** hopes it will make gaming more straightforward for PC owners, too.



Ritual Entertainment (which is currently working on *Sin*, above) has poached Gary McTaggart and Charlie Brown from 3Dfx to work on 3D engines incorporating inverse kinematics and NURBS-based rendering. Satisfying such progressive gaming companies with DirectX will be an ongoing challenge for Microsoft



This image (above) shows the type of smooth surface rendering that is made possible by using NURBs, one of the new 3D modelling techniques which Microsoft is considering supporting in its seventh interpretation of DirectX. The image is a demonstration file rendered with the freeware *POV-Ray 3* raytracing package. Rage Software's *Incoming* (right) was almost a showcase demonstration for the power of DirectX, since the company elected not to produce a Glide version for Voodoo chips

3DNOW! TWO STEPS AHEAD OF KATMAI

AMD beats industry leader Intel in the race to pipe more polygons to 3D processors

Intel is in the habit of naming its upcoming processor technologies after North American landmarks. True to form, the company's next chip is codenamed Katmai, after an Alaskan wildlife reserve known for its bears. Quite fitting really, as rival chip-maker AMD has made the world's leading purveyor of processors appear very much a slow and rambling animal.

AMD has just unveiled a new chip called the K6-2 which includes a feature called 3DNow! technology – a set of hardwired special instructions specifically geared-up for the floating point calculations crucial to the generation of 3D scenes in games. It's something Intel famously left out of its 57 original MMX instructions, and which the company now plans to incorporate into the Katmai processor, which will essentially be a new variant of the Pentium II. The major difference is that the K6-2 is out now, while Katmai will hit streets in early 1999.

AMD has not only beaten Intel to a new processor technology, but has scored a major coup in convincing Microsoft to support 3DNow! technology under DirectX 6.0. This application programming interface (API) for games will be out this month, and any 3D game supporting DX6 will automatically benefit from the 3DNow! instructions. Games can be programmed to support 3DNow! natively, while several graphics card companies, including nVidia, 3Dfx, Matrox and ATIare, are building additional support for 3DNow! into their driver software.

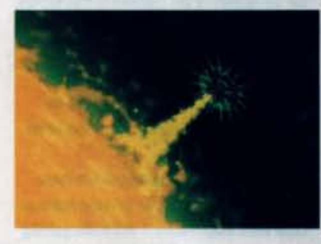
3DNow! incorporates 21 new instructions to speed up floating-point operations. Whereas 3D graphics cards accelerate the rendering of 3D scenes, 3DNow! assists the process of scene generation at the front end of the 3D pipeline, working out the actual physics of the game world and moving polygonal objects. According to **Richard Baker**, AMD's marketing manager for Northern Europe, 3DNow! enables game programmers to create settings that use more polygons, and have more moving features in them as well. 'You now have more scope available to manipulate the environment that the game's played in. You can interact and move more objects around on the screen,' says Baker.

Support from game developers has come thick and fast. *Incoming* from Rage already supports 3DNow! as does *Unreal* and *Forsaken* by Epic and Probe respectively. Digital Anvil, LucasArts, Inner Workings and Imagine Studios have also voiced their support. Even so, there remains the suggestion that what 3DNow! really needs is a killer game that will sell K6-2 to a suspecting public that looks for the words 'Intel Inside'.

'This is an interesting time for us, because we've always produced parts that basically followed on from Intel,' counters Richard Baker. 'Until recently we've pretty much always been one or two speed grades behind. 3DNow! technology is the first time any chip manufacturer has had something before Intel. We've got the technology six to nine months before them.'

It's worth noting, however, that with K6-2 chips arriving at 266, 300 and 333MHz, Intel's top-end parts run at 350 and 400MHz, with the 450MHz Pentium II on the way. So, bullish as AMD may sound, it's still a speed grade behind. Furthermore, Katmai will boast 70 floating-point instructions compared to 3DNow!'s 21. Its release date has been brought forward from the second quarter of 1999 into the first, with Intel citing the success of its 0.25-micron chip-making process now deployed in many of its plants.







Dreamworks' *Trespasser* (top), and Imagine's *Ares Rising* (above and centre) have both pledged support for 3DNow!



Edge tested a variety of games on an AMD reference machine (above). The overall results were quietly impressive

Testing the K6-2

Edge recently put a K6-2 reference machine supplied by AMD through a gameplay test. The machine packed an impressive punch when compared to a similarly specified Pentium II and was particularly good running *Forsaken* and *Incoming*. This was down to the fact that the former has a number of DirectX 6.0's graphical implementations in its game code, while the latter has actually been optimised specifically for 3DNow!. Playing *Unreal* was a closer-run affair, with the K6-2 proving narrowly superior, while the ultimate 3D benchmark, *Quake 2*, was clearly better on the Pentium II. This is because *Quake 2* has been heavily coded for Pentiums, though a patch optimising the game for 3DNow! is on the way.

PROCESSOR	FORSAKEN @ 640X480*	QUAKE 2 @ 640X480†
K6-2 333MHz	67fps	13.4fps
Pentium II 300MHz	28.5fps	16.9fps

* median frame rate, running in software † running in software

Cutting Edge Cuttings

NEXT GENERATIONS

Capcom has announced the next three collections in its retro-themed *Generation* range. *Generation 3* will contain *Son Son*, *Vulgus*, *Exed Exes* and *Higemaru*. *Generation 4* has *Gun Smoke*, *Commando* and *Mercs*. Finally, *Generation 5* features *Street Fighter II; Championship Edition* and *SFII Turbo*. **Edge**'s order is already in.

TOCA FOR TWO

Codemasters has confirmed the release of the follow-up to its highly successful *Touring Car*-based racing experience for November. Developed by the original team as well as incorporating members of the *Colin McRae Rally* crew, *TOCA 2* will feature twice the number of tracks and should prove more accessible to new players.

SELL OUT

Microsoft has sold Softimage Inc. to Avid, a US-based company responsible for high-end digital video systems. Softimage provides state-of-the-art development tools for the games industry, as well as being involved in movie special effects. Given the popularity of the software, continued support is assured.

LEMMINGS ON THE ATTACK?

In an uncharacteristic spurt of activity, Scottish developer DMA Design confirms two new titles

DMA Design has revealed it has two new games on the way. The first of the two, *Attack*, is thought to be a spiritual successor to the *Lemmings* series, set for release on PC, N64 and PlayStation. It's loosely depicted in traditional DMA style as 'Millwall supporters let loose in Jurassic Park'. Company PR supremo **Brian Baglow** told **Edge** that, 'Yes, we have a game called *Attack*, but that's all I can say.' The design sketches of small dinosaurs that adorned the walls of DMA's headquarters during **E60**'s visit now make a great deal more sense.

Clan Wars is the second title, due early 1999 for PC. 'Take arcade action, mix with castle-busting adventure strategy and you have the beginning of *Clan Wars*,' claims the firm's Internet site. DMA also reckons that the game will 'change the way you look at games.' Expect more news, and hopefully screenshots, soon.





***Attack* is set to feature a range of diminutive dinosaurs (main). However, little is known about *Clan Wars* (above)**

3DFX GOES 2D

New Voodoo Banshee chipset boasts fastest 2D as well as top 3D graphics

3Dfx has finally introduced its much-anticipated Banshee Voodoo graphics chipset. Banshee combines the proven 3D graphics capabilities of Voodoo 2 with what 3Dfx claims is the fastest 2D graphics chipset on the market. Several prominent manufacturers are to produce boards based around Banshee, but prices have not yet been announced.

Unlike Voodoo Rush (3Dfx's disappointing 2D/3D chip based around the original Voodoo chipset), the company hasn't radically simplified the chip. It's also created the 2D technology in-house this time. This should mean Banshee is free of the compatibility clashes that plagued Rush.

But with the chipset targeting the competitive OEM market, cost consideration has prompted 3Dfx to remove one of Voodoo 2's two texture-processing units. As a result, games which benefit from Voodoo 2's single-cycle multi-texturing – mainly firstperson shoot 'em ups like *Quake 2* – will run a little slower on Banshee. On the 2D side, 3Dfx boasts that Banshee offers the industry's most complete hardware implementation of Microsoft's Graphics Driver Interface.

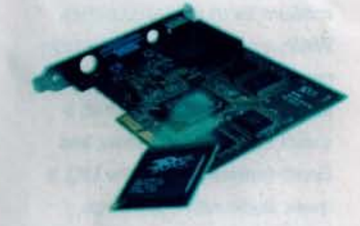
Andy Keane, 3Dfx's VP of marketing, said the company didn't feel it needed to improve the 3D capabilities beyond Voodoo 2 for Banshee, pointing out that the chipset wasn't really for hardcore gamers but was a Voodoo option for manufacturers and consumers looking for a general 2D/3D solution. 'Voodoo 2 is really just getting started,' he said.

Facing increased pressure from the likes of nVidia, Intel, S3, Matrox and VideoLogic, is 3Dfx in danger of losing both its hardware edge and its close developer relations? Not according to Keane, who cites the plethora of 3Dfx-labelled games at E3 as a sign of the brand's continuing strength. '3Dfx is *the* development platform,' he says.

He also denied that the arrival of the universally liked DirectX 6.0 would impact on the success of Glide, 3Dfx's much admired API. 'Glide is still the thinnest layer [between the game and the graphics hardware].' Keane adds that the supposed conflict between his company and Microsoft's DirectX suite is largely fictitious. 'In our mind, there's no difference between Direct3D and Glide development. We have more people supporting D3D than Glide.'

Keane refused to be drawn on 3Dfx's next chip, codenamed Rampage, alhough he did admit that the specifications were ready. He went on to point out that 3Dfx's rivals were all claiming success by supporting features 3Dfx had introduced two years ago. In contrast, the next Voodoo chipset is to be 'a generational change.'

Keane said the next-generation silicon would be manufactured using a finer 0.25 micron process (pioneered by Intel) which will result in smaller, faster chips. Expect improved anti-aliasing and lighting support at the pixel level when it arrives next Spring.





The speedy Banshee chip is prone to fly off the board if not securely fastened (top). By using the 2D graphics buffer to map an image of the screen onto a polygon as a texture, mirror effects can be created (above)

UNREAL REALMS

According to 3D Realms' Website (www.3drealms.com), the forthcoming *Duke Nukem Forever* (to be published by GT Interactive) has switched to use *Unreal*'s graphics engine. Previously, *Forever* was due to employ *Quake II* code to shift its polygons. And, while it's better, *Unreal*'s engine is also cheaper.

COLOURFUL PRICES

Nintendo has revealed Japanese pricing for its Game Boy Colour, set for release this September. Whether UK gamers will pay anything like the ¥8,900 (£40) Nintendo will be asking on the streets of Tokyo hasn't been decided. New titles for the expanded handheld will be displayed in up to 56 colours, and older games in four to ten.

DVD FOR PSX2?

SCEI president Teruhisa Tokunaka has revealed to America's *Business Week* magazine that the PlayStation 2 may feature a DVD drive. Even a basic single-sided DVD can hold around 4.7Gb of data, while a dual-layer, double-sided disc is capable of storing 17Gb. Expect full Dolby Digital surround sound, and more FMV. A lot more.

LUCAS DEPARTS

The protracted sale of Virgin Interactive Entertainment by current parent Viacom has cost the company dear. US-based LucasArts is searching for a new European publisher, albeit reluctantly given the previous good relationship between the two firms. The first title to be affected by the break is the promising *Grim Fandango*.

(out there)

REPORTAGE FROM THE PERIPHERY OF THE VIDEOGAMES INDUSTRY

Roger Sanchez gets Fluid

It's all *Wipeout*'s fault. Psygnosis' 1996 title introduced an aspect to videogames that had been absent for years: hip music. The aural sensation of The Chemical Brothers and The Prodigy perfectly matched the awesome visuals, and went some way in defining its status.

Since then, music has become an important consideration for publishers, as the westernisaton of *Gran Turismo*'s soundtrack and John Carpenter's score for *Sentinel Returns* will testify. The success of *Parappa the Rapper*, while essentially a Japanese childrens' game, showed Sony that the PlayStation and its CD-ROM operating system is the perfect medium for music-based games. Which is perhaps why the company now has two other music games in its repertoire – *Baby Universe*, a sort of interactive light show, and *Depth* (retitled *Fluid* for the UK), a music studio with a difference.

At last month's annual DJ Culture exhibition in Manchester, New York house DJ and producer **Roger Sanchez** took time out to speak about *Fluid*, the first release of the projected six-game *Yasashi* series. 'I was interested that Sony wanted to make a game where people can actually alter the music and soundscape and make that the focus,' he claimed.

Taking control of a dolphin, players are challenged to find sound samples in an underwater environment. Only when this is accomplished does the game allow access to the Music Editor, where elements can be put together and saved to memory card. 'You have different rhythmic and musical elements that people can put together like a jigsaw, learning how to build and breakdown tracks,' Sanchez elaborated. 'I think it's a very good introduction to actual studio production techniques.'





Fluid's essence is its creative core – a non-competitive, imaginative and learning experience. It is a brave move for Sony because *Fluid* is not a 'game' by conventional standards and is quite an uncommercial move, but it represents the logical progression from titles such as *PaRappa* and *Bust-A-Move*. 'It's more of a chillout game, where you can relax and expand your mind,' said Sanchez. 'It's more organic.' Future *Yasashi* games will follow an experimental path, nurturing other creative aspects previously seen only on computers. It seems that diversity is set to pervade console software…



(Top row) Images from the forthcoming *Fluid*. (Above) Roger Sanchez attempts to mix and load *Gran Turismo* simultaneously. Some feat

Lara Croft: is there an end to her talents?

It's official – there *is* going to be a *Tomb Raider* movie, thanks to Paramount Pictures. The company's licensing division – Viacom Consumer products – recently heralded its purchase of the *Tomb Raider* rights at a Movie Licensing show in New York, claiming that Lara had attracted more attention than anything else at the event. 'Lara Croft and *Tomb Raider* have it all,' enthused Viacom president **Andrea Hein**. 'This is a property filled with strong storylines, and which has had outstanding consumer response to the games and products associated with it. Lara's strong standing in pop culture, and the talented production team signed to the live action feature, show all the indications of *Tomb Raider* as a huge licensing hit'.

Such optimism is to be expected, of course, but is it misplaced? Hollywood execs were probably just as excited about the 'Super Mario Bros', 'Double Dragon' and 'Street Fighter' films (see last issue's Out There), until they flopped faster than a Viagra user who's forgotten to keep up with his medication. However, those movies hinged around the likes of Bob Hoskins and Raul Julia – hardly the greatest pulls for young male gamers. The success of the *Tomb Raider* movie will no doubt be safely assured if the producers pick the right gal to play Lara. (And put her in a tight enough vest, naturally.)

Whatever happens, though, Andrea Hein is wrong on one important point. There is a *Tomb Raider*-related product out there which is unlikely to receive an 'outstanding consumer response'. Yes, the Lara Croft album (cleverly entitled 'Come Alive') is finally to be released by Naked Records and distributed in the UK by Discovery Records. The CD includes three mixes of the single 'Getting Naked' as well as two versions of 'Beautiful Day' and accompanying tracks like 'Really Real', 'Feel Myself' and 'Rock Your Own World'.

As could be expected from an album which combines the talents of Rhona 'Help me, I'm languishing on Channel 5' Mitra and Dave 'Is it possible for me to sink any lower?' Stewart, the resulting cheesy house and clumsy electronica is not for the feint hearted. Neither, frankly, are the lyrics – most concern Lara's independence and strength, but 'Beautiful Day' features this priceless glimpse into her drinking habits:

'A summer's day in London,
All will be just fine,
Lying on the common,
A pint of lager and lime.'

Fans may also be interested to know there is an additional CD-ROM track on the album, which offers a few pics of Mitra in various poses and a little info about the venture. Although in **Edge**'s opinion the only info you really need is: 'don't buy it'.





A Rare insight

Putting an email address on the Internet is an open invitation to humanity, in all its many and varied forms, to pump its views, however whacked-out they may be, directly to where it matters.

Videogame companies are no doubt aware of this when they supply those enticing 'contact us' headings as a part of their Web pages, but the crazed ramblings that consequently flood in beside the usual praise, criticisms and questions are hilarious nonetheless.

Take Rare's electronic postbag, for example. The Warwickshire-based developer only opened its new Website in May, but the accompanying contact address has already attracted more than its fair share of bizarre correspondence. Here are just a few offerings, grouped by theme, and totally unedited:

CONFUSION

Date: Fri, 15 May 98 23:31:15 -0600

Subject: BOoo hoo hoo

Help me., a ravanous snake has taken my KIGOLD game hostage and is tanting me with "You too shall face the wrath of un-fun games! hahahahah) please tell me, HOW CAN A SNAKE LAUGH???!??

Date: Fri, 15 May 98 01:45:48 EDT

Subject: how to get the spyder

i just wanted to know how to get the spyder in goldeneye becouse i want to getthe spyder so if it is not much troble to send me the instrutions how to get the spyder please send them thank you

---

Date: Fri, 15 May 98 17:17:09 +0000

Subject: Donkey Kong

Why won't your company make a Donkey Kong video game?

RAMPANT ILLITERACY

Date: Thu, 28 May 98 235859 +0200

Subject: Webside

Today I've look at your Webside and I'm very surprised. Your Webside was realy impressed. The Screenshots for THE PERFECT DARK was phantastic. I hope, that this are the Quality for the Final Version of this Game. The Graphic of GoldenEye and the Soldiers of GoldenEye was for an Rare Production an Desaster. You have produced phantastic Games in the last Years as DKC or Blast Corps, and the (I hope as soon as possible) coming Game BANJO-KAZOOIE is an wonderful Game from Rare. In the British Television (BSkyB) Program FOX KIDS NETWORK its the DKC TV-Series are running, and this Graphic of the Series was the best, wat I've see in the last Years.

VITRIOL

Date: Sat, 16 May 98 18:05:32 -0400

Subject: stink

I hate your company, you st

Date: Sat, 16 May 98 22:35:30 -0500

Subject: game

Why do you make a game with such great game graphics and go off and make it so faggetty? You make it gay by "Bottles, and Tooty" that so dumb. the same thing goes for DKR, all the characters are gay. Little kids cannot beat a game like that, it's too hard for little kids, yes I've played it. if you make games that hard, don't make 'em so GAY. PLEASE think about this when you make your next great game. OK. please e-mail me with some response.

WEIRDNESS

Subject: Type of game

Date: Fri, 15 May 1998 15:22:39 -0700

Rpg!!!!!!!!!!!!!!!!!!!!!!!! One starting...........ummmmmmmmm......find out someone

---

Date: Fri, 15 May 98 18:38:20 -0700

Subject: MY EYES HURT

you guys got a cool logo up in the corner(you know that little spinny rare thing),Anyways i must have watched that thing spin around for hours without blinking, now my eyes hurt and there all red and dry, THANKS ALOT!

Those wishing to delve further into the psyche of Rare 'fans' can check out the forum at www.rare.co.uk, where many similarly profound offerings (as well as a fair amount of considered and intelligent comment) can be discovered.

it's dark

it's very dark

she's perfect



Rare's presence on the Web is one of the most impressive of any developer. In the run up to this year's E3, it introduced *Perfect Dark* in a teasing day-by-day, drip-feed fashion

NUMEDIA

A MEETING POINT FOR MEDIA CAPITALISING ON THE DIGITAL ENTERTAINMENT REVOLUTION

GADGETS



Sony DCR-TRV9E miniDV camcorder

MiniDV is the fastest growing area of the camcorder market and it isn't hard to see why. Digital Video formats like this are massively superior to analogue rivals like VHS-C and 8mm, giving almost perfect sound and picture quality. And, because it's digital, getting images out of the camcorder and on to a PC is easy – simply link the two together using an IEEE1394 (FireWire) interface.

Sony's latest miniDV camcorder comes with exactly the kind of features that Tarantino wannabe's expect – a 60x digital zoom, stacks of digital picture-editing effects and the slightly bizarre NightShot which enables movie footage to be shot in the dark. And, for the money, it's a very fine camcorder indeed.

£1,600
Sony
Tel: 0990 111999
Out now

Game Boy Camera and Printer



Nintendo managed to sell over 500,000 Game Boy Cameras in the first three weeks of its Japanese launch in February and could well see a similar performance over here. The fisheye lens turns the handheld games console into a fully fledged digital camera complete with a variety of jokey editing effects, a time-lapse mode and the ability to make mini movies by stringing up to 47 different images together. Turning the results into mini works of art is easy, too – plug in the printer and snaps are turned into stickers that can be plastered anywhere.

Obviously image quality on the Game Boy's LCD screen and stickers is poor, but that's hardly the point. Game Boy mania could be about to take over the world once more.

£90 (camera, printer and cable)
THE Games
Tel: 01703 653377
Out now

MUSIC



7 Ignitions
Boom Boom Satellites
R&S

The purpose of this mini album is twofold: complementing a CD of remixes by the likes of Depth Charge and Dons of Quixote is a platter containing the Satellites' original 12-inch works. Michiyuki Kawashima and Masayuki Nakano draw on techno and hip-hop, though a love of dub and the addition of live rock instrumentation sets them apart from so many of their Japanese contemporaries. Of the mixes, Depth Charge's reworking of 'Dub Me Crazy' succeeds best. The Meat Beat contribution is the only one that fails to add anything. But for fans, this is the first chance to actually have them on CD.



Junk Science
Deep Dish
Deconstruction

Washington's Deep Dish rose to prominence with the hit-making remix of De Lacey's 'Hideaway', further cementing their reputation as ambassadors of deep house with their own singles 'Stay Gold' and 'Stranded'. Few could have anticipated a debut album of this calibre – the depth and breadth of the music transcends the house label without abandoning the dancefloor vibe. Everything But The Girl's reworking of 'Stay Gold' might be predictable, but doesn't lessen the impact. And when BT appears, it's obviously more about crafting quality sounds than name-dropping. Musical dishes don't come much deeper, or more appetising.





Sharp DVD DV-560H player



£500

Sharp Electronics

Tel: 0990 274277

Out now

DVD's launch in April may have come across as more of a whimper than a bang, but the disc-based movie format is fast gathering momentum with an ever-increasing range of software and machines to play it on.

The cutest bit of kit so far has to be the compact DV-560H, which has been designed to appeal to the millions of mini-system owners out there. As well as features like built-in Dolby Digital decoding, the DV-560H also comes with a Digital Gamma Correction circuit, which increases detail in dark areas of an image without oversaturating the rest. The result is some of the best images yet seen from a DVD player, and for less dosh.

Robotica Toybot

£360

Robotica

Tel: 0141 353 2261

Out now

There's still a long way to go before robots take over those much-hated, mundane jobs, but this is a start. The Toybot is a six-axis robotic arm controlled by a PC using the serial port and some basic, but easy-to-use control software.

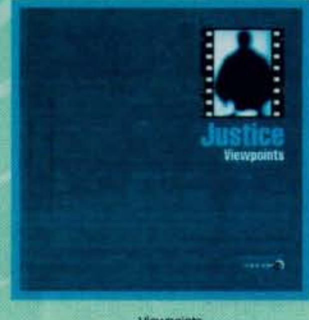
The Toybot comes either as a kit – which requires a screwdriver, pliers and soldering iron to assemble – or ready-made, although there's an extra charge of £40 for this privilege.

Naturally, the Toybot can't actually do very much – it essentially just picks things up then puts them down again – but it could be just the thing for science students, robot junkies, fans of Metal Mickey and anyone else with just a little too much time on their hands.



Innovator
Derrick May
R&S

Derrik May's 'Innovator' plunders a remarkable back-catalogue for two CDs' worth of musical heaven, one featuring the originals, the other the remixes. Although credited, along with Juan Atkins and Kevin Saunderson, as one of the original Detroit techno mob, this selection demonstrates how May's work has always been more about soul than mere machine music. This stretches as far back as 1987, with the still-fabulous 'Strings of Life' and debut single 'Nude Photo', right through to 1993's 'Icon', while demonstrating throughout just how much of a debt modern electronica owes May. His music remains as fresh, and vital, as ever.



Viewpoints
Justice
Recordings of Substance

Having already carved a formidable reputation working alongside Blame, Tony Bowes has followed it up remixing the likes of Garnier and James Hardway, running his own label, Modern Urban Jazz, and now penning his solo debut. Although obviously rooted in drum'n'bass, 'Viewpoints' shows Bowes is just as influenced by electro and rolling hip-hop. The fascination with ultra-dense sounds and muffled melodies is initially daunting. But airy cuts such as 'Aquisse' demonstrate a way with electronica that recalls the best of the early techno years, showing just how adept he is at gene-splicing genres. Fascinating stuff.

CD-ROM

A Bronx Family Album – The Impact of AIDS

Two facts: life in the Bronx ain't easy, and CD-ROM multimedia has never been this gritty. Profiling the lives of Ralph and Sensa, two Puerto Rican immigrants living in New York, *A Bronx Family Album* tells a sorry tail of drug abuse, domestic violence and HIV.

The story is illustrated using black-and-white photography taken over a seven-year period during which time the disc's auteur Steve Hart became intimate with this family struggling on America's bottom rung. Presented simply and stylishly, *A Bronx Family Album* remains touching and informative without revelling in the misfortunes of its protagonists. The turbulent relationship between Ralph, Sensa and their kids is played out very matter of factly while delicate jazz plays in the background. This serves to make the odd moments of tenderness and affection captured here seem all the more harrowing, particularly when the fate of Sensa and her children unfolds.

Though video clips pop up occasionally, this isn't cutting-edge multimedia. Its clean presentation and gritty, well-handled subject matter give this disc an edge over many of its flashier, more technologically accomplished peers. Many will keep peace of mind by avoiding Steve Hart's dark and moody collection of snapshots from the sharp edge. Unfortunately that means multimedia like this rarely makes commercial sense, and it's highly unlikely that *A Bronx Family Album* will make a big splash in sales terms. Still, it's definitely worth a look.

Published by Thames and Hudson
Developed by Scalo
£22.50
Out now (Mac/Windows)



BOOKS



Leonard Herman
Publisher: Rolenta
ISBN 0-9643848-2-5
Price: $20
ordering information:
www.creativewebs.com
Tel: 00 1 732 462 83439

Phoenix – the fall & rise of videogames

While there have been a number of books that have attempted to tell the story of computer games, most recently JC Herz's lop-sided 'Joystick Nation', the definitive version has yet to be written. In many respects, 'Phoenix – the fall & rise of videogames' does not advance the big picture either. What it does have, however, is one unique quality: an obsessive interest in detail. Whereas conventional histories are triumphal, as if the growth of the computer game has been a predetermined success fuelled by large corporations, Leonard Herman knows differently. Instead, he tells a story that is built on technical advances and small-scale failures.

Starting in 1962 with Steve Russell's 'Spacewar' and continuing in year-sized chapters from 1970 up to 1996, 'Phoenix' chronicles every console and peripheral that has ever been produced. It lists their capabilities, price, availability and, in most cases, the reasons for their eventual failure. Sometimes this level of detail becomes too much and readers may find the book dry at first – it's probably best to tackle one chapter per sitting. In an industry that seems to pride itself on only looking forward, such a detailed viewpoint slowly becomes addictive as the basic framework of the emerging world games market becomes apparent.

As Sega prepares to launch Dreamcast and re-enter the battle with Nintendo and Sony, its executives could do a lot worse than to pick up a copy of this and remember the mistakes of the past.



James Flint
Publisher: 4th Estate
ISBN: 1-85702-824-4
Price: £17

Habitus

So far, 1998 has been the year where hip novelists try to make sense of our 20th century lives. Following on from Douglas Coupland's 'Girlfriend in a Coma' comes James Flint's 'Habitus'. In many ways they are similar books. For example, the most important character in both is a child conceived in a peculiar manner, who grows up to be messianic. Equally both books are strangely millennial in tone, although without specifically referring to it. However, where Coupland is an inward-looking author, Flint is more interested in the technological world man creates and inhabits. He was, after all, a technology writer for *Wired* and it shows here. Not since Thomas Pynchon exploded with 'Gravity's Rainbow' has a debut author tried to create such a scientifically transcendental universe.

Quantum theory, genetic mutations, Alan Turing, the secrets of cabalistic Judaism, Benoit Mandelbrot, Laika (the first dog in space), probability theory, JFK, the Internet, fractals, predictive theories of gambling, Fermat's last theorem and the theological paradox of good and evil all have their place in this novel. Unsurprisingly, the plot sometimes gets a bit confusing and many people might buy this only to file it unfinished next to Stephen Hawkins' seminal 'A Brief History of Time'. Flint's attempt to make sense of the rise of information and the way it's changed our lives may be doomed to failure, but it's an entertaining ride.

MUSIC



We Are Reasonable People
Various
Warp

A celebration of all things Warp-ed, the latest shindig finds 12 Warp artists airing new and exclusive material. This is something of an event given that it includes the notoriously slow-working Nightmares On Wax, not to mention a thoroughly deranged collaboration between Aphex Twin and Squarepusher. Plaid and the ever-excellent Autechre are on hand to provide more sober doses of techno, while Jimi Tenor gives the party the necessary swing. Throw in appearances from Andrew Weatherall and ex-LFO man Mark Bell and it all amounts to another madly eclectic release from Sheffield's finest.

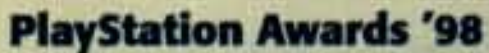


How to Operate With a Blown Mind
Lo-Fidelity AllStars
Skint

It's the swagger as much as anything that makes the Lo-Fis so memorable. The sound fuses dance with rock more successfully than any band since Underworld and gives a nod to the likes of The Stone Roses and Spiritualised, but mostly it's the same dominating attitude of the band's heroes that can be found on this astonishing first album. Mark E Smith-esque rapping, slinky disco bass and pumping acid lines all loom large, while 'Battleflag', a collaboration with rock group Pigeonhead, just could become the dancefloor's summer anthem. 'How To Operate' is as abrasive as it is inventive, but that's exactly what makes it such a compelling track.

エッジ

[BIG IN JAPAN]



PlayStation Awards '98

Among the many functions held in Tokyo, Sony's PlayStation Awards is rumoured to be the biggest and the best buffeted. An occasion to recognise the best sellers, the top Double Platinum prizes of ¥2,000,000 went to *Gran Turismo* and *Bio Hazard 2*. *Gran Turismo*'s producer Kazunori Yamauchi said he'd be spending the money on petrol for his development team. Other luminary attendees included SCEA's Phil Harrison, *Metal Gear Solid*'s producer Kojima-san and, of course, Mr Tokunaka, head of SCE. Surprise videos from *Final Fantasy VIII* and a PlayStation conversion of *Soul Calibur* wowed the crowds, each of whom went home with a commemorative bottle of Cabernet Sauvignon.





Strike in downtown Tokyo

If the World Cup grated here in the UK, at least videogames provided a refuge. Spare a thought for the Japanese, then, as even Sega erected giant screens to force football down commuters' throats in downtown Tokyo. But at least it was *Virtua Striker*. Japan had every chance in Sega's world cup – all the entrants were Japanese and seven of the 32 participants represented Japan. But the winner of a flight to France and tickets to the hottest match (er, Japan vs Argentina) was Wijihiro Fijuyama-san, who achieved ultimate glory with Croatia.

Sony-a-saurus

Sony may have boasted of 30 million console sales at the recent PlayStation awards, but it had to endure some less-than-successful practice runs. Here's a rare shot of Sony's MSX2 machine, 1988 vintage. Next month from the Big in Japan museum: Sony's Model-T jalopy.



Let's do Saturn!

Coming to a job centre near you – Segata Sanshiro (below), who has been the Japanese mascot for the Sega Saturn for nearly a year. He's loosely based on Sugata Sanshiro, a classic Japanese character who appeared in a novel featuring a karate fighter, made into a movie in 1942 and later a TV series. In the spirit of Father Christmas, most of Japan believes Sanshiro really existed.

The mascot (played by Japanese comedian Hiroshi Fujioka (below), who won fame as The Masked Rider – an early influence on the Power Rangers) has appeared in all Sega's recent TV commercials, cavorting with zombies for *House of the Dead* and clowning with the Japanese football team for *Become Coach* and Sega's World Cup game. The adverts were accompanied by the chant 'Segata Sanshiro Sega Satan Shiroo!' – in English: 'Segata Sanshiro, let's do Saturn!'

His most recent public duty might render him unemployed, though, as he sliced open a curtain with a katana to reveal the cocktail bar at the recent Dreamcast launch (see News, E60). With the new console on the way, will Sega now demand hara-kiri?















Small change for coin-ops

Game developers may harp on about creating arcade-perfect conversions of popular titles, but nothing can come close to owning the real thing. Scattered around Tokyo's Akihabara electronics district are a handful of small shops which specialise in selling coin-op hardware for the home.

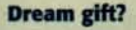
As a taster, the *Virtua Fighter 3* board shown here costs ¥120,000 (£510), while *VF2* costs just ¥20,000 (£84). In addition, a control set (which also contains a television modulator) must be purchased for around £100. *Puzzle Bobble 2* was available for a scarcely believable ¥500 (around £2), and a variety of recent Capcom games from ¥4,000 to ¥12,000 (£17 to £50). Dreamcast? PlayStation 2? Not even close.











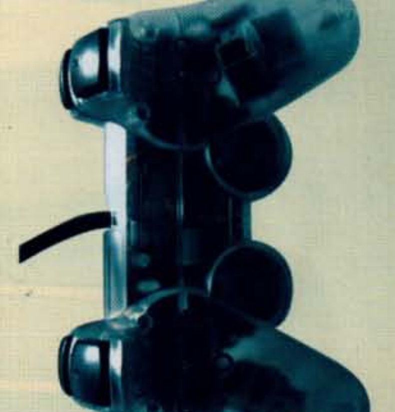
Specialist stores stock a vast collection of accessories for discerning arcade otaku, from PlayStation pad adaptors (top left), to replacement buttons – presumably for hardcore *Street Fighter* fans (above right)



Dream gift?

Those lucky enough to attend Sega's New Challenge Conference for Dreamcast at Tokyo's New Otani Hotel were rewarded with one of these 'Sega Memorial Options'. Closer inspection reveals that the bearer is entitled to a free gift to the value of one Sega share on May 21, 1999 – one year on from the announcement.

Featuring a portrait of Sega Japan president Shoichiro Irimajiri, the Option's value is obviously dependent on Dreamcast's retail sales. So ring an importer and order one, now…



It's all clear now

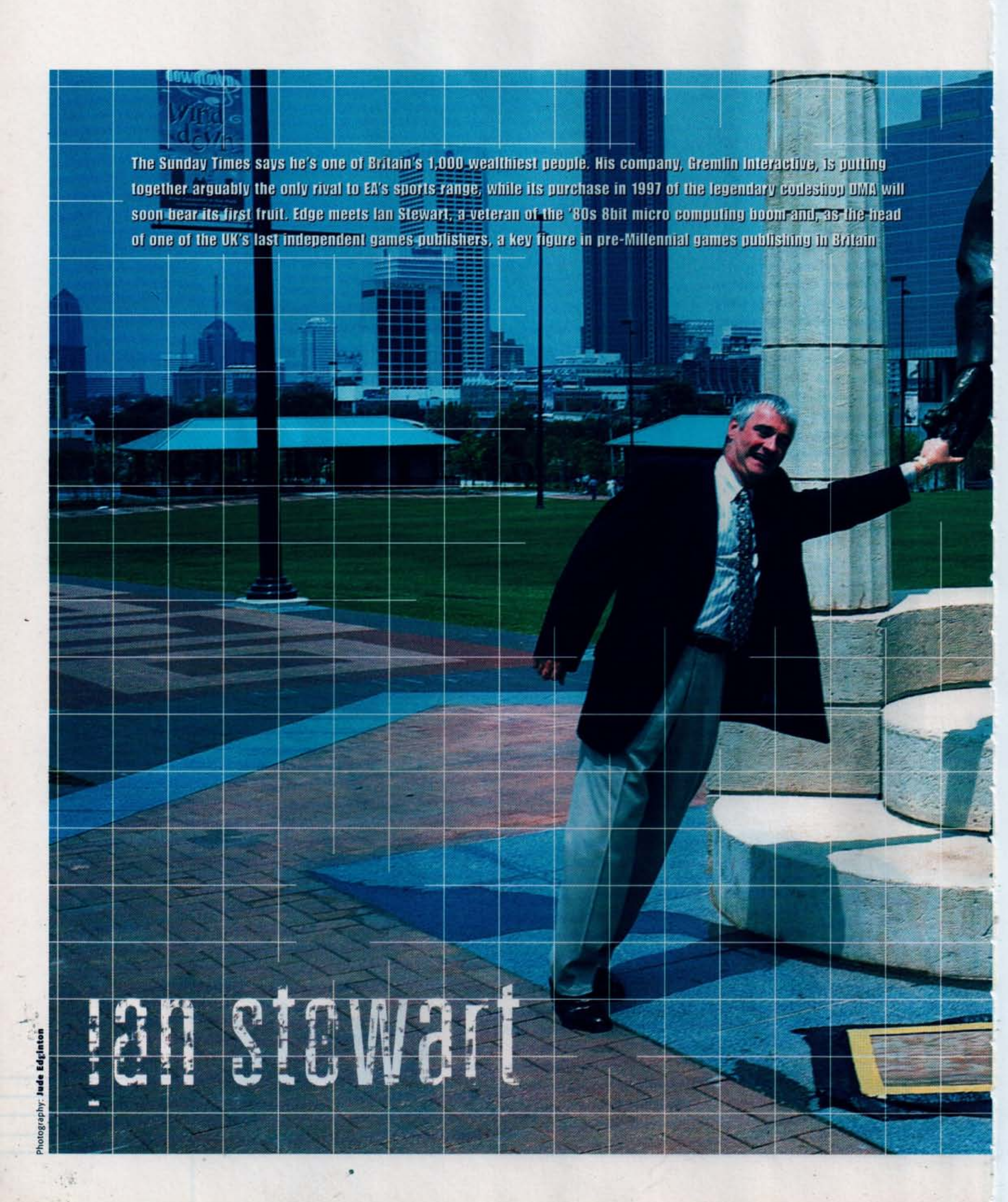
Sony's Dual Shock Analog PlayStation controller has been a favourite of **Edge**'s for some time now. However, the recent range of special edition models that Japanese gamers have been treated to are of particular note, available in white, black, crystal and smoke grey. Close examination of the translucent versions reveals that Sony's controllers are truly 'Dual Shock'. Each of the arms contains a separate motor, one for low-frequency vibrations and the other to deliver a stronger kick.

Not only are the Japanese versions rather cooler than the standard grey iteration on offer in the UK, they're also around half the price at only ¥3,300 (£13).





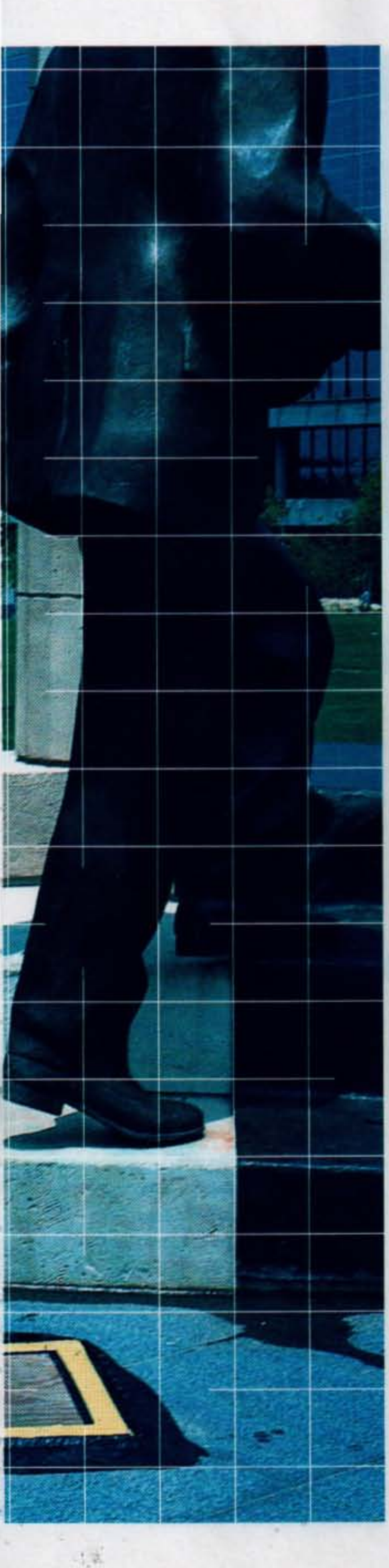




The Sunday Times says he's one of Britain's 1,000 wealthiest people. His company, Gremlin Interactive, is putting together arguably the only rival to EA's sports range, while its purchase in 1997 of the legendary codeshop DMA will soon bear its first fruit. Edge meets Ian Stewart, a veteran of the '80s 8bit micro computing boom and, as the head of one of the UK's last independent games publishers, a key figure in pre-Millennial games publishing in Britain

ian stewart

Photography: Jude Edginton



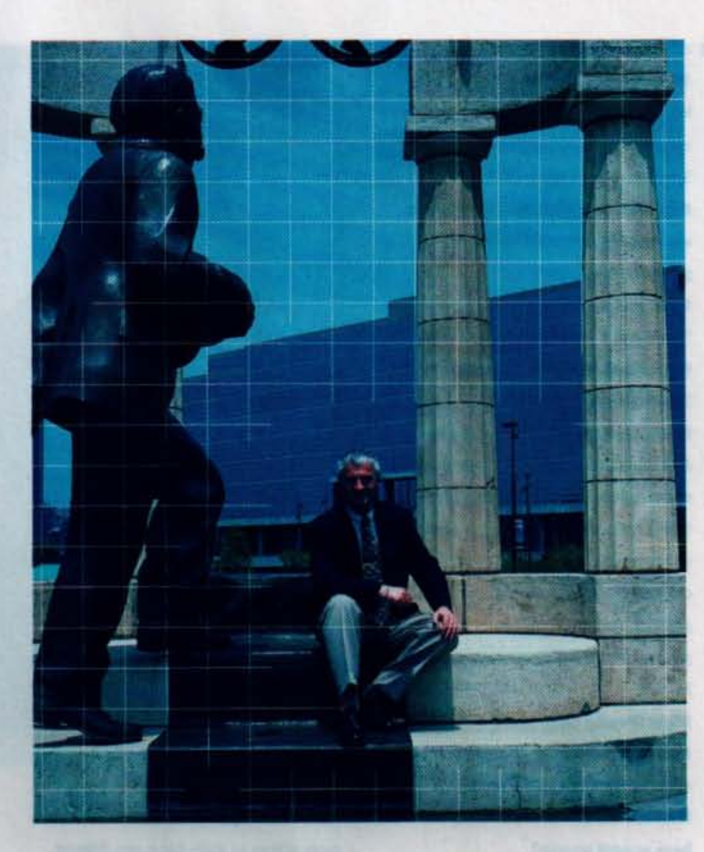
By his own admission Ian Stewart, co-founder and chief executive of Gremlin, has always been a player rather than a gamer. After all, it was Stewart who astutely suggested that symbolic miners' strike references be added to Peter Harrap's hugely popular '80s platformer *Monty Mole*, Gremlin's first breakthrough game. It was this element that saw the game covered widely in the national media. Gremlin was launched using the proceeds of Stewart's first business, the computer shop Just Micro. The same nose for business has kept his company independent for 15 years.

During those years, the UK has been transformed from a fading and rioting industrial power to the sanitised and creativity-championing 'Cool Britannia' of Tony Blair. Companies such as Bullfrog, Rare, Psygnosis, and Gremlin Interactive can all point with pride to their place beside moviemakers and musicians in the new order. But while other games developers have fallen prey to Electronic Arts, Nintendo and Sony, Stewart has followed an alternative route, choosing instead to let Gremlin take its chances on the stock market last year.

The subsequent purchase of DMA Design has added a fresh zest to Gremlin's release schedule, which has already boasted some much-admired titles such as *Zool* and *Realms of the Haunting*, not to mention the *Actua* sports range. With games like *Actua Tennis*, *N$_2$O*, *Buggy*, *Soul Bringer* and the DMA title, *Body Harvest*, still to come in 1998, Gremlin appears to be in fine fettle. But in his suite above the bustling E3 show floor, **Edge** asked Ian Stewart whether Gremlin Interactive can hold its own in the increasingly competitive global marketplace...

Edge: How did it feel to be ranked in the *Sunday Times* top 1,000 richest people in Britain?

Ian Stewart: Poppycock! I don't believe I am. I was slightly embarrassed by it. I didn't particularly want to see my name there – it doesn't change me as a person.



Edge: It must be incredible to come from fairly typical beginnings and end up with this enormous empire...

IS: Yeah, but it *has* taken 15 years! Things change gradually, your expectations change gradually. It's not like winning the lottery.

Edge: When you started out, you could attribute your success to spotting a gap in the market and exploiting it ruthlessly. How do you keep up to date with emerging gaps now? Do you rely on your front-line soldiers?

IS: Absolutely. There's no way that Ian Stewart as an individual can solely go out there and steer the company.

Edge: Have you had a chance to stroll around the show yet here at E3?

IS: I've seen what I needed to see because the troops have been out there, looking at the products. I'll have all the videos I need.

Edge: Do you get a chance to play games any more?

IS: What's really great for me is that we now have another truly mass-market product with the PlayStation – it's bringing down the product complexity which enables anyone of my age to play these games efficiently. I'm very much a 'pick up and play' person. I don't have a lot of time to play games for hours upon end.

I love playing *N$_2$O*, for example, simply because I can pick it up, play it for 20 minutes and come away buzzing.

Edge: Whether or not it should be true, people seem to get less excited by games as they get older.

IS: I don't, I get more excited.

Edge: You play more games than you did 15 years ago?

IS: Yes!

Edge: Were you not really a gamer in those days?

IS: No, very much not. I definitely play far more games now. But I think if I'm anything, I'm more of a 'game participant'. I get as much enjoyment out of watching other people playing games as I do playing them myself – especially as nine times out of ten they're much better at them! I really get a buzz out of that.

Edge: How does this E3 show compare to previous years?

IS: Every E3 has improved upon the last. Obviously over the past two years the market ▶

conditions have changed tremendously. There has been a change of market leadership away from Nintendo, then the PC moved through a strong period and now Sony is very much taking the lead.

Edge: As a publisher, how do you take account of the cyclical nature of platform dominance?

IS: I think the gambling terminology is a 'spread bet'.

Edge: Hmm. You aren't showing any Saturn games out there...

IS: No, strange, that. We didn't bring the Amiga products either! As a company, we endeavour to cover all our bases, not only from a hardware point of view but also from a category point of view – sports products, roleplaying products, action products, racing products. That gives us a broad spread, and it gives us a bit of security should there be a big shift.

Edge: Gremlin came to life in 1984. Obviously we'd been through the Atari reign by then, but could you have foreseen the enormous industry we have around us now?

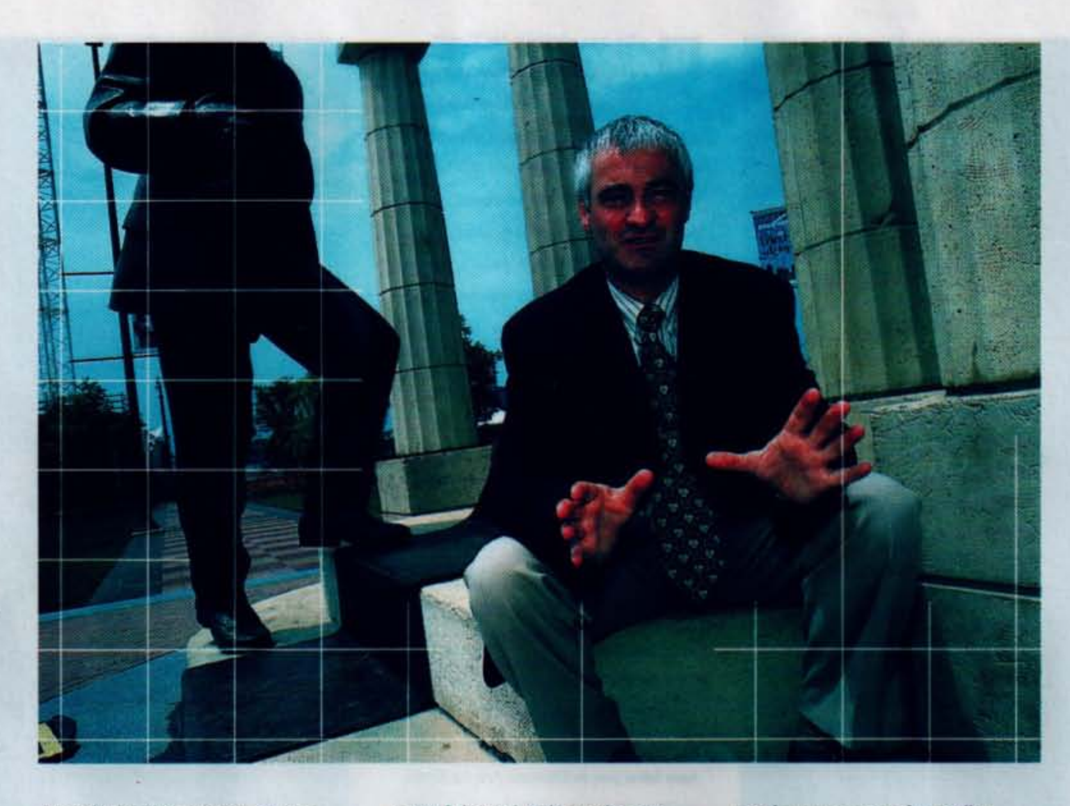
IS: I don't even think that Nostradamus would have forecast what's happened over the last 14 years: phenomenal technological breakthroughs. Every time you saw a progression in hardware, you visualised it and you thought 'this is getting real now'. But the fact is that now it really is. We're looking at products now that are visually lifelike.

Edge: It seems that as games have got more realistic, some trends have returned from the early days. *Space Invaders* was considered really violent, and then violence took a back seat. But now we've got *GoldenEye*, which brings the issue back into focus. We've almost reached the point where we'll need to deliberately go back to the abstract.

IS: Yes, definitely – quite apart from the fact that if we don't do that the products are going to become very stale, since they're going to look very similar.

Edge: Would you agree that games are tending to get like that anyway?

IS: Oh, very much so. Hopefully, what could be recognised with Gremlin – with the range of products that we're putting together now and the addition of the DMA products – is that we are taking a more left-of-field approach. This gives us the opportunity to come in from an angle that is very different to everyone else's.



SAMPLING DMA

Edge: Did you deliberately purchase DMA to get those kind of games?

IS: It was driven from a creativity point of view, without a doubt. We spent time talking with David [Jones], looking at products in fairly early demo stages, and something I saw very early on was that they were very exciting – the type of products that generally weren't being created in the industry.

Edge: After spending all that money on DMA Design, it must be tempting to say to punters 'these are Gremlin games'. Isn't there a danger of submerging DMA's identity?

IS: No, we're not doing that. The DMA logo will appear prominently on all the products. I don't see any point in acquiring a label such as DMA [otherwise]. And remember, DMA was never used as a label. It was only really branded within the industry.

Edge: David Jones is now the creative director of Gremlin. What has he brought to the company?

IS: He's brought that little bit extra to the creative team. He's forced us to stand back from the products and look at them that little bit closer. He's making us look at the real angles that are coming from them and where we're hoping to take the product.

Edge: So has he made the move down to Sheffield?

IS: No, he's still in Dundee. He's extremely respected throughout the company. That's simply because he does have this tremendous eye for creating these totally off-the-wall products. But that isn't to say the whole of Gremlin will start producing these kind of products.

Edge: So you haven't farmed any of DMA's games out to other studios within Gremlin?

IS: No, we have plenty of our own original titles coming through. And we have the *Actua* sports range based in Sheffield as well. I wouldn't want to take anything away from the creativity and the team we have in Sheffield – it's extremely strong. But they can only learn from the experience that David has brought with him.

'I don't think even Nostradamus would have been able to predict what's happened...

UPPER LEAGUE

Edge: You mentioned the *Actua* sports games there. Obviously the only company that has established a really strong sports brand is EA. Could *Actua* become the European rival to that?

IS: It already is. If you were to ask EA, it would say it only has one rival in Europe, and that's the *Actua* range.

Edge: But the *Actua* range is only a couple of games.

IS: We have soccer, tennis, ice hockey...

Edge: *Tennis* hasn't made it out yet.

IS: Yes, but it will do, one day! [laughs]

Edge: There's *Actua Golf*, too.

IS: Yeah, we're out there. We're obviously not

going to produce American football and baseball products.

Edge: Why not?

IS: There isn't a big enough European market for those games.

Edge: You could always start selling them in America.

IS: We can sell them in the US, but it wouldn't really be a very good use of our resources.

Edge: Do you not think that if you're going to try and rival EA you need to cover all the bases?

IS: As far as the sports simulations are concerned, we're not using the *Actua* brand in the US. Our sports brand there is dedicated to Fox Sports Interactive. It's a major powerhouse as far as sports promotion in the States is concerned.

Edge: But if you look three years into the future, when the industry has consolidated even further, wouldn't it be much more valuable to have a globally recognised *Actua* brand?

IS: I think they can run as two different brands. One brand for Europe and one for America. It would be very difficult for us to compete with Electronic Arts in the United States. Fox Sports Interactive is already a brand. It's already a major sports television network. Fox is now becoming a major interactive brand. We'd have to step into the market very fresh with the *Actua* brand, and spend millions upon millions of dollars establishing it.

Edge: What's the setup with Fox? Is it a year-on-year deal?

IS: It's a relationship that started this year. There are a number of products we're working on with them at the moment – seven in total – and the relationship is such that we're happy working with them now and we'll see what the future holds.

'The market is educated enough not to accept substandard products...'

Edge: Is it getting more difficult to compete with, say, EA in America? Three years ago, could you have been more confident about taking them on?

IS: Possibly three years ago, yes.

Edge: Do you think Europeans are going to find it increasingly difficult?

IS: [Long pause] I think every market is difficult. There is a consolidation going on in the marketplace, and there are a number of players that are standing out and proving that they can be leaders because of the distribution they have in place, their marketing and suchlike. Those players are there now. I don't think it's going to get any more difficult than it is. If you have the right product on the marketplace, you will always get distribution and I believe that we have the right products coming through.

Edge: But if you could always get distribution then why do you have to work with Fox?

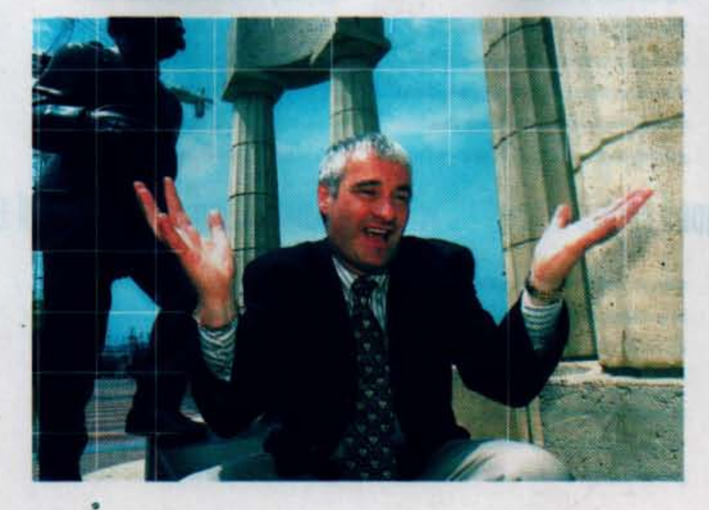
IS: The timing just isn't right for us at this moment. It wouldn't be a wise move. The company [Gremlin] is on a growth pattern – quite an aggressive one, but one which is very much under control – and if we looked to step into the North American market and publish the Actua range there at this moment in time, or any other products under those brands, it would probably leave us too exposed.



Edge: Talking about European companies, there are smaller setups like Gremlin and Codemasters, then there are these bigger outfits like Infogrames, which is growing, and Eidos, which has come from nowhere. Do you ever look at those companies and get just a little bit scared?

IS: I don't get scared at all. I think what a lot of people don't realise is that we're more profitable then a lot of these other companies. A lot of them don't make profits. Codemasters and Empire are both profitable and well-run companies. I think we're possibly in a better position than them to expand, though. Our product portfolio is broader than theirs, which I think is important – you can be vulnerable if your portfolio is too narrow.

...over the the last 14 years: phenomenal technological breakthroughs'



Edge: Don't you think there's a case for accepting you're not going to survive like this, three years down the line. If you are going to merge with, for example, GT or Midway – to establish a pan-global operation – wouldn't it be valuable to do that now, rather than having to jump out of the fire in a few years time?

IS: You're probably asking me a question that I don't really want to answer at this moment in time! That's a difficult one.

Edge: Infogrames' Bruno Bonnell has been very public about his intention to build a European rival to EA. That sort of talk has a habit of generating its own momentum.

IS: Bruno has done a tremendous job of building up the expectations of what ▶

Infogrames are going to be doing. The PR machine has been rolling along for some time now, and Bruno is probably one of the best people in the industry to maximise that. He's a wonderful character. I'm not saying that Gremlin is going to put itself in the same position. What I am saying is that whatever move we do make, whether it be an acquisition or whatever, we'll still ensure that the company goes forward in a profitable manner. We're not the type of company that shoots for the stars. We're the type of company that targets strategically, and achieves those targets.

CITY SLICKERS

Edge: It was nearly a year ago now that Gremlin floated on the market and went public. How has the city changed the culture of the company?

IS: It hasn't really changed the company that much. Because of the way that the company is run, we were in a good position to take on the rigours of city requirements from an accounting and reporting point of view.

Edge: Gremlin has always been perceived as a 'gamer's' publisher – has the fact that you're now a quoted company changed your games?

IS: No, it shouldn't change the games at all.

Edge: So you haven't had to start creating games that money men in the city understand?

IS: No, at the end of the day all the city is interested in is results, and how the company is progressing.

Edge: Does the city understand interactive entertainment?

IS: Well, that all depends on who you're talking to! There are a group of analysts who follow the industry now who are young, enthusiastic guys. When you're talking about the other investors, they very much look at stock and the overall company performance rather than look at any one particular product.

Edge: Have there been any real benefits from flotation?

IS: I think one of the benefits from the flotation is that financially it gives us stability. It allows us to take longer-term decisions as to how much we spend on products and how much time we can spend on them.

Edge: It enables you to spend longer on games?

IS: Yes, because of the stability of the company, we tend not to have to make short-term decisions. You can forecast much more easily knowing you're in a good financial position.

GETTING TECHNICAL

Edge: On another topic, with *Actua Soccer* Gremlin was partly responsible for introducing motion capture to the UK. Do you still see Gremlin as a technologically driven company?

IS: Yes, I think so. But where it's changing now is that it's not necessarily down to inventing new technology – the really clever thing is how you build these products, and the tools you create that allow you to do it, which is something that's invisible to the user.

Edge: One phase you've already been through a couple of times yourself is that of gaming going mass market and then going bust. Do you think that gaming has broken out of that cycle now, or will it be back in the doldrums in a matter of years?

IS: I don't think we'll ever go back to that stage now. When you look at why that occurred in the past, it was due primarily – if you go back to the Atari situation – to a great glut of mediocre products that the user could no longer get excited by. Following that there were the cheap home computers, the Spectrums and Commodore 64s, and then the next market dip was due to technological expectations. People stopped spending money on buying products because they were looking forward to the next set of technology.



Edge: You could argue that the Atari crash happened because there was suddenly a mass market that didn't understand what they were buying.

IS: I think there's less chance of that happening now. The cost of developing products is running into hundreds of thousands of pounds. And the market is educated enough to not accept substandard products.

Edge: Do you really think it is? If you look at the PlayStation base in the UK, it's upwards of two million. Quite a large percentage of which probably do just walk into the shops and buy a football game because it's got the FIFA logo on the box.

IS: Bad games don't sell now, if you look at the charts. It used to happen in the past. God forbid, we probably did it ourselves.

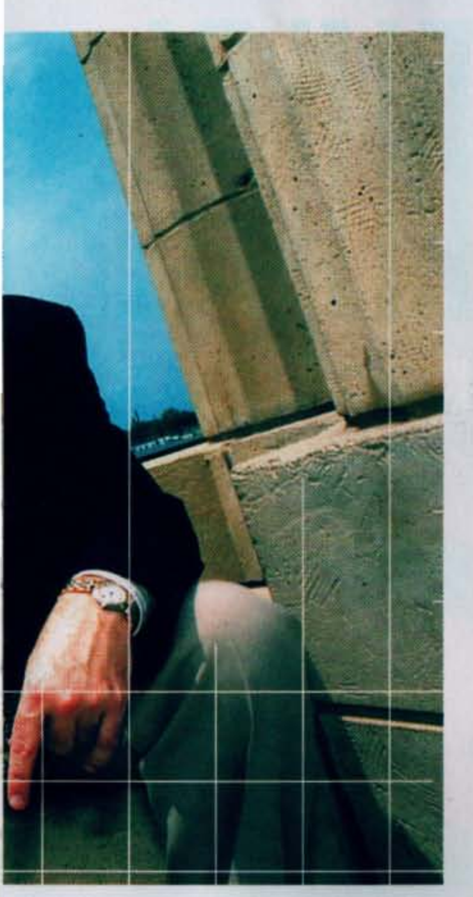
Edge: Do you think it was a viable strategy back then?

IS: Was it a viable strategy in the past just to shovel products out? Yeah.

Edge: Acclaim did it.

IS: Yes, I read your interview with Greg Fischback [E59] and I thought he was very honest. And I think Acclaim is now putting things right. They've identified that you can now no longer get away with putting a substandard product out – the consumer will

'Gremlin is a very good sports range... with extremely solid games. One of the things you'll see change...



'We're going to be using more video footage in products than most feature films'

not accept it. And even if you do have a certain element of the consumers who are uneducated, they very quickly get educated by disappointing products.

THE NAMING GAME

Edge: How do you think the customer in the street perceives Gremlin?

IS: I'd like to think as a wildly exciting, technology-led producer of games...

Edge: And do you?

IS: That's what I'd like to think. That's not what I actually know is the situation. What they see in the Gremlin product is a very good sports range and people that come out with extremely solid games. One of the things that you'll see changing as far as the company is concerned is that things will become much more exciting.

Edge: Is that DMA's influence again?

IS: No, this is very much a marketing influence and the requirement to see that the company goes forward.

Edge: Some might argue that the average punter wouldn't think anything. They might have enjoyed some of your games in the past but they might not be aware that they were Gremlin games, aside from the *Actua* games.

IS: *Actua* is definitely a brand, as far as Europe and especially as far as the UK is concerned. Gremlin is not a brand, it's a label. I don't believe there is loyalty to labels in the marketplace. Each product is taken in its own right, and rightly so.

Edge: So you don't think there's any point in investing a lot of money in building up the Gremlin name?

IS: It is important that Gremlin is built up as a name because it's important that the city understands what we are doing, as well as the consumer. We will be, as I've said, more aggressive in the way the company markets not only its products but its name as well.

Edge: Companies like Bullfrog, Blizzard and id Software can just produce their games and everyone will look out for them. Surely there's some value in becoming somebody of whom people will say 'it's the next Gremlin game'.

IS: Maybe it will be the next DMA game or the next *Actua* product.

Edge: Okay, *Actua* and DMA accepted, but what about the other Gremlin games? That's the key question.

IS: That's something that if you look around the stand at this moment in time, if you look at *Soul Bringer*, this is another opportunity with a leading-edge product with which we could well establish a Gremlin RPG brand or whatever. That's something which we're going to look at very closely. But you have to lead with something. It's easier for a content provider like Blizzard or id because they're working in one genre, and that's what they're focused on.

Edge: Also, they all made their names with one great game...

IS: Very much so. We're well aware that we have to do it in a number of genres.

BEATING THE BOX OFFICE

Edge: Does the Internet present a threat to publishers?

IS: I think there will always be a place for publishers. The Internet won't take over the world, not in our lifetimes. What a lot of people very seldom realise is the enormous involvement that's required to go into making a product. I want people to know that what goes into producing them is bigger and more involved than what's involved in the film industry. It's something that's a tremendous danger to the film industry because our industry is getting better and better at what it does. I believe that as the industry moves forward now we're going to be making products that require more content than movies – that are movies in their own right. We're going be using more video footage in products than most feature films.

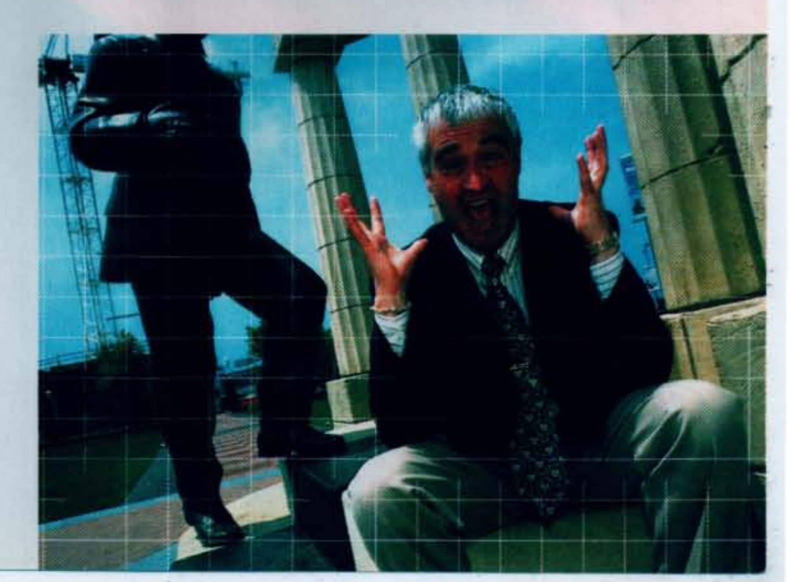
Edge: The film industry had 75 years to work out how to make movies before the multi-million-dollar blockbusters came along. The games industry has only had a few years. Most of the companies out there – with the odd exception such as SquareSoft – haven't got experience of managing projects on anything like that scale. Will that be the next stumbling block for developers?

IS: No, I don't think so. I think Square has done an absolutely fantastic job, and looking at *Final Fantasy VIII*, it's a wonderful visual experience. There's no reason why 75 per cent of software publishers can't do the same.

Edge: Do you see Gremlin in competition with other games publishers or with other content providers? For instance, will it bother you when the movie 'Armageddon' comes out?

IS: I think we're in competition with any business that eats up leisure time, whether that is watching television, going to the cinema, playing soccer, reading, sleeping. What we have to do is continually keep people awake! [Laughs] Not eating, not sleeping – just wanting the definitive immersive experience.





PRESCREEN

A roll call of the newest arrivals in the world of videogaming

IF IT MOVES, MODEL IT

Is the argument for 3D all too shallow?

Sprites and bitmaps, say your prayers. The graphical third dimension has truly broken in to the innermost compound.

This final act of dimensional cleansing targets adventures and strategy games. Cavedog's *Total Annihilation* and Westwood's *Blade Runner* were the warning shots. Now Relic's *Homeworld* (see p38) and Origin's *Ultima IX* will finish the job.

But is the revolution wholly welcome? Games are about gameplay. Where 3D enhances games – and *Mario 64*, *Tomb Raider* and *Quake* proved it could reinvent them – **Edge** salutes it. But beware the polygonal armies of a game-killing regime.

As Brett Sperry pointed last month, 3D doesn't necessarily improve strategy games. When generals plotted WWII, they used 2D maps and counters because the tabletop view gave the best strategic overview. Three-dimensional graphics looks great, but their angles can prove redundant; hills can obscure the big picture. *Hostile Waters*, *Homeworld* and the rest have everything to prove.

When Churchill planned D-Day, he didn't spend months with glue and airfix models. But 3D games need an engine that takes at least a year to build. And woe betide any game that doesn't look as good as the best come release day.

PC shooters provide a warning. As developers have made ever better 3D engines, they have paid scant regard to anything else. At least the fixed graphical standards of consoles leave room for innovation. Is it coincidence that *GoldenEye* came on the N64, despite the plethora of PC shooters?

Some games just shouldn't be 3D. Maxis ditched its plans for a fully navigable 3D city in *SimCity 3000* when it realised that slow, plain graphics enabling players to walk around the city compromised what its game was about. Worse, some great game concepts never make it because their creators aren't 3D experts. **Edge** often sees good ideas buried under lacklustre graphics engines. The months pass and the graphics slowly improve – but at the expense of the game itself.

Polygonal 3D games remain a new ball game. When even Rare falters with *Banjo-Kazooie*, it's clear the rules are still being discovered. And 3D games haven't just abandoned many of the 2D gameplay features that sustained gamers for decades, they've obsoleted some of the talent that made them – the people more into making fun than matrix manipulation. Would *Donkey Kong* and its ilk have been made if its creators had to first master the maths required for realtime 3D?







Edge looks forward to *Homeworld* (left), Relic's 3D space strategy adventure, with relish. Games such as *Ultima IX* (centre) and *Hostile Waters* (right) continue the all-pervading 3D assault

INDEX

Edge's most wanted

The videogames making waves before their arrival

F-Zero X	Body Harvest	TA: Kingdoms	Legacy of Kain 2	Spike
(N64) Nintendo	(N64) DMA Design	(PC) Cavedog	(PS) Crystal Dynamics	(Arcade) Sega
Nintendo's 64bit update of its SNES classic looks set to provide a quality alternative to the realism of *Gran Turismo* and *Colin McRae Rally*.	The first fruits from Gremlin's purchase of DMA tastes as sweet as a cherry. DMA is poised to enter the ranks of those who've made it on N64.	Unless you count *Myth* (and **Edge** doesn't), there hasn't been a decent new fantasy strategy game since *Warcraft II*. Barring a disaster, this will be it.	One of the few promising PlayStation titles on show at E3, Crystal Dynamics' sombre effort currently looks as if it could offer novel gameplay features.	With its simultaneous fourplayer mode, AM2's latest fighting fest delivers more than just the genre's usual graphical embellishments.

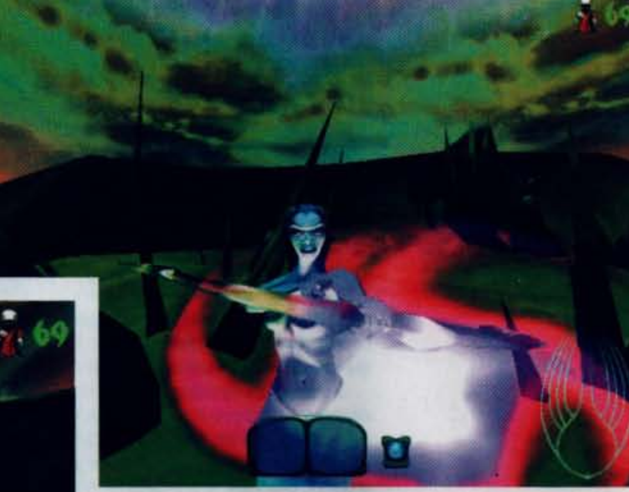
PRESCREEN ALPHAS

THE GAMES CATCHING **EDGE**'S EYE THIS MONTH

GIANTS

FORMAT: **PC** DEVELOPER: **PLANET MOON**







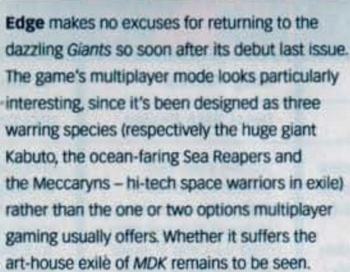












Edge makes no excuses for returning to the dazzling *Giants* so soon after its debut last issue. The game's multiplayer mode looks particularly interesting, since it's been designed as three warring species (respectively the huge giant Kabuto, the ocean-faring Sea Reapers and the Meccaryns – hi-tech space warriors in exile) rather than the one or two options multiplayer gaming usually offers. Whether it suffers the art-house exile of *MDK* remains to be seen.

DUKE NUKEM: TIME TO KILL

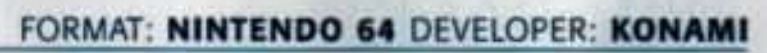
FORMAT: **PLAYSTATION** DEVELOPER: **GT INTERACTIVE**





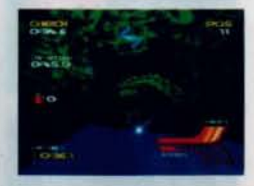


Although *Duke*'s gameplay remains largely unaltered (which is not necessarily a bad thing), the camera has been switched from first to thirdperson. *Time to Kill* is spread across the ages, with Nukem treated to a variety of time-period specific weaponry, and an increased level of blood and guts.



WIPEOUT 64

Having chosen the likeable futuristic racing title as the first of its internal N64 developments, Psygnosis will be hoping this version proves as popular as its PlayStation predecessor. The use of the 64bit machine's analogue controller works particularly well, but *Wipeout* veterans could find the experience a little too easy.

CASTLEVANIA 64

FORMAT: **NINTENDO 64** DEVELOPER: **KONAMI**












Tentatively pencilled in for an end-of-year release in Japan, Konami's vampire-laden adventure makes its much-awaited 64bit debut. These latest screenshots are encouraging, showing one of the four characters available to players in the final version as they battle the seemingly endless procession of Dracula's minions. Like the real thing, these attack mainly after sunset, preferring to hide during the day, and players must therefore plan their exploration accordingly.

◀ APOCALYPSE

Activision's Bruce Willis vehicle draws ever nearer. Through careful use of texture mapping, *Apocalypse*'s character, Kincaide, bears a reasonable resemblance to the Hollywood star.

The game's plot pitches Bruce into a struggle with the four horsemen of the Apocalypse, no less. Spread across 12 levels, the thirdperson action is promised to be 'furious', 'non-stop', and 'over the top'.



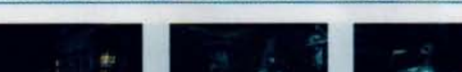


ASSAULT

While ASC Games' *One* may have lacked certain gameplay aspects under its visual veneer, Telstar's pseudo-3D shoot 'em up effort hopes to deliver the goods. One and twoplayer action is assured over 40 levels split into six distinct environments populated by hideous alien creatures. These require swift termination by one of the game's many upgradeable weapons.







THIEF: THE DARK PROJECT

FORMAT: **PC** DEVELOPER: **LOOKING GLASS STUDIOS**

Formerly known simply as *The Dark Project*, Looking Glass' firstperson 3D action-adventure title differs substantially from its peers by introducing elements of perception and ambitious AI routines into the game's characters. As such, players should not be surprised to find guards investigating the noise made by their character's footsteps as they creep around, for example.









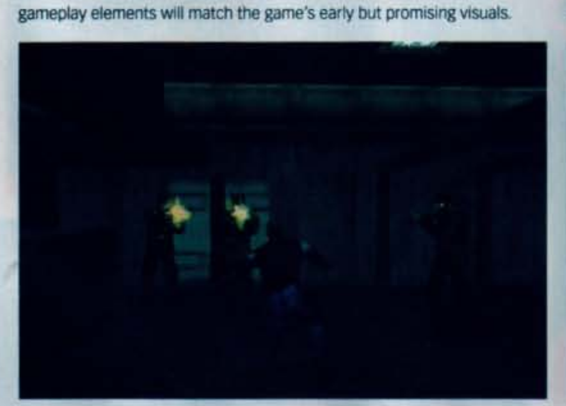


WIN BACK

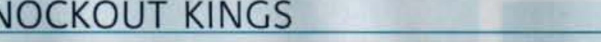
FORMAT: **NINTENDO 64** DEVELOPER: **KOEI**

Probably inspired by *Metal Gear Solid*, *Win Back* could be the closest N64 owners could get to Konami's espionage affair. Levels must be negotiated with the minimum of fuss, so as to reduce the possibility of being detected by the enemy – the dreaded Crying Sheep organisation. Hopefully the gameplay elements will match the game's early but promising visuals.









KNOCKOUT KINGS

FORMAT: **PC/PLAYSTATION** DEVELOPER: **EA SPORTS**



Why boxing should be so different to the amply covered martial-arts field isn't clear – sadly, perhaps it's because boxing is largely a Western sport. EA has exclusive rights to Muhammad Ali, Evander Holifield and Sugar Ray Leonard, but whether it's recruited equal design talent remains to be seen.









WILD 9

FORMAT: **PLAYSTATION** DEVELOPER: **SHINY ENTERTAINMENT**

Including a level where the player races through swamps by boat and another which is just one long drop through air-ventilation pipes, Shiny's *Wild 9* is as different as it is late. Most of the levels are 2D platform affairs, with the player wielding The Glove and Rig to pick up enemies and smash them into the environment or grab hold of the terrain to traverse obstacles.







MESSIAH

FORMAT: **PC** DEVELOPER: **SHINY ENTERTAINMENT**










At last, *Messiah* looks like a game deserving of the attention its engine has received. The engine – which adds or reduces polygons in 3D models to maintain the frame rate – is innovative, but so is the gameplay. The hero is an apparently harmless angel who can posses creatures and then use their weapons and skills, or deliberately injure them. In multiplayer mode players can judge the weapons they're likely to face from the appearance of their foe.

◀ V2000

Edge has now received a fully playable PlayStation version of David Braben's own update of his Archimedies and Amiga classic, *Virus*. Although it remains to be seen whether the fixed viewpoint can be adjusted, *V2000* is nonetheless an appealing prospect. Players must save the human race from the alien invaders and their deadly red virus. Expect a range of novel weaponry and detailing.

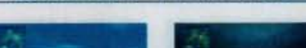






HOSTILE WATERS

FORMAT: **PC** DEVELOPER: **RAGE SOFTWARE**









Instead of the massed armies of titles like *C&C*, *Hostile Waters* gives players a select – and limited – offensive strike team of specialised units. For instance, tanks are virtually unstoppable but incredibly slow, so they must usually be flown in by helicopter. It's an interesting compromise, and it could make the task of creating a strategy game in 3D less difficult.





SIN

FORMAT: **PC** DEVELOPER: **RITUAL ENTERTAINMENT**

Valve's *Half-life* and Ritual's *Sin* are filling the void left by *Unreal* in the PC shooter hysteria stakes. *Sin* is winning attention for sheer attention to detail. Cut scenes, *Duke*-style banter and a training area like that owned by Lara Croft all help Ritual's cause. More neat touches include a harpoon for subaquatic levels and a gun which can move opponents around the level.











S.C.A.R.S.

FORMAT: **PC/PLAYSTATION/NINTENDO 64** DEVELOPER: **UBISOFT**











Futuristic racing with bouncy, beach-buggy-like cars and an armoury of *Wipeout*-style weapons, *S.C.A.R.S.* handles well and looks fine, too. The imaginitive track design travels through Aztech ruins and polluted dystopias and offers players a variety of routes through every level.

LEGEND OF ZELDA: OCARINA OF TIME

FORMAT: **N64** DEVELOPER: **NINTENDO**

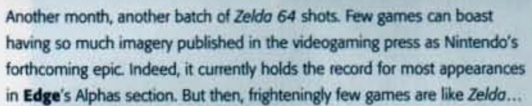












Another month, another batch of *Zelda 64* shots. Few games can boast having so much imagery published in the videogaming press as Nintendo's forthcoming epic. Indeed, it currently holds the record for most appearances in **Edge**'s Alphas section. But then, frighteningly few games are like *Zelda*...

SPIKE

FORMAT: **ARCADE** DEVELOPER: **SEGA (AM2)**





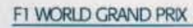








Sega's exciting and ambitious new beat 'em up title allows up to four cabinets to be linked via optic cable enabling simultaneous multiplayer street fights. The arenas are impressively large, and players can decide to team up against – or with – any of the other contestants as they wish. Graphically, the game represents another step forward for Sega's established dominance in this field. *Spike* will make its first playable appearance at the forthcoming JAMMA show.



F1 WORLD GRAND PRIX

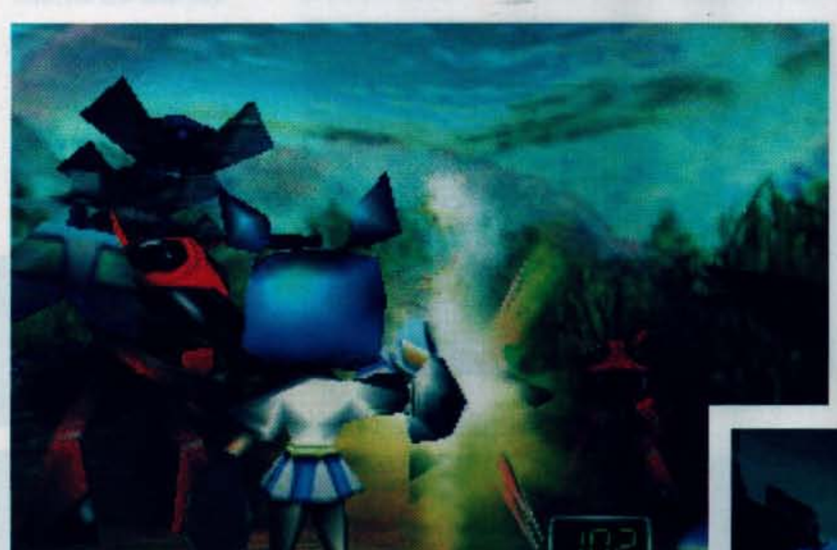
The format is still awaiting a racing title to challenge those found on Sony's rival machine, but Paradigm's *F1* title could finally deliver what N64 players have longed for since the format's first appearance in 1996. It features all 17 circuits from last year's season, commendably detailed scenery moving at an impressive rate as well as dynamic weather and an intriguing scenario mode.





JET FORCE GEMINI

The seemingly unstoppable Rare unveiled its second title at E3 and looks set to continue the company's recent run of successful titles for Nintendo's console







Some of the more impressive effects in *Jet Force Gemini* can be found in the ambitious lighting used throughout, particularly for the game's many weapons

The landscapes are in 3D, allowing players free exploration of the vast environments (top), populated by disposable, bug-like alien baddies





The game's alternating levels require players to switch between the main three characters, thus exploiting their individual attributes

Format: **Nintendo 64**

Publisher: **Nintendo**

Developer: **Rare**

Release: **TBA**

Origin: **UK**

Announced just prior to the E3 show and shown only as a brief segment of Nintendo's looping promotional video sequence on its stand's substantial projection screen, *Jet Force Gemini* passed an awful lot of people by. Yet Rare's potential-packed title warrants attention, promising as it does to take all the elements of a classic shoot 'em up and place them within a 3D polygonal world with players viewing the action via a thirdperson perspective.

The game is set in an alien universe far, far away. Its delicate balance is under threat from the intergalactic crimelord Mizar, whose tyrannical reign must, naturally, be terminated. Normally a relatively simple task if it didn't involve having to battle his army of minions which largely comprises crazed, gargantuan insect-like space-roaming beings. In order to achieve this formidable and seemingly impossible (not to mention foolish) task, players can swap control between the three main characters – Juno, Vela, and Lupus the dog – and each of their individual skills must be fully exploited in order to ensure progression through the various levels.

So as to introduce some gameplay variety, the latter alternate between frantic action and sectors requiring a more stealthy approach. Of course, secret areas revealing bonus items are to be found within the vast, freely explorable levels, with puzzle elements ensuring the requirement of some brain activity. Furthermore, having not forgotten the importance of weaponry in a shoot 'em up, plenty of power-ups are obtainable to amplify the already-impressive artillery.

In typical Rare form, *Jet Force Gemini* also features multiplayer options to complement the oneplayer experience. Another interesting





Yet another example of the swish lighting effects (above) and further evidence of the variety of alien lifeforms awaiting termination (above left)







Even at this stage, the levels seem hugely varied, with noticeably differing environments populated by bugs waiting to be killed

feature is the inclusion of dynamic weather conditions, forcing players to adapt their combat strategy depending on the climate's wildly unpredictable nature.

Yet, given its video only appearance, *Jet Force Gemini*'s most impressive aspect currently remains its graphical quality. The footage revealed several excellently varied locations featuring highly detailed textures and impressively complex light sourcing – particularly noticeable in the game's fire effects. The designers have created a rich, colourful, lunar-like landscape together with a series of space-age building interiors more akin to Rare's usual cartoon-like look rather than the grave realism found in *GoldenEye*. Given the game's nature, this aspect works particularly well.

Moving the plot along are a series of cinematic cut scenes, and an orchestral score further enhances the game's overall filmic feel. Rare remains typically silent about other specific facets of the narrative.

E3 is becoming a platform for the Twycross-based developer/publisher to surprise the videogaming world by revealing new projects (*Perfect Dark* being the other show announcement this year). From what **Edge** has seen of *Jet Force Gemini* so far, plenty of destruction is assured and, as ever, Rare has complemented the on-screen action with some truly impressive visuals.

Moreover, it provides weight to the argument that, in visual terms at least, the UK developer is now easily challenging the projects emerging out of NCL's Kyoto offices, something which two years ago would have been considered highly improbable. Sadly, so many other N64 licensees still seem unable to even come close to the standards set by the premier duo.



Although *JSF* involves disposing of insectoid alien scum, the visuals retain Rare's typical colourful appearance and childlike innocence

HOMEWORLD

There's nothing new under the sun, but up in the heavens Relic is blending Westwood's classic realtime strategy template with 3D shooters to create a visually stunning saga...









Ships launch in style (above) but the docking procedure is more impressive. As in the classic *Elite*, ships turn and twist to find the correct angle, then land en masse. (Top right) Who says strategy gaming can't be explosive?

Homeworld looks like the best bits of 'Star Wars' or 'The Last Starfighter'. It's not the graphics, though *Homeworld*'s ships are certainly superbly animated. Rather, it's the choreography. Ships roll into battle in delta formations and dock in unison like toast popping back into toasters. Fighters fly in classic pair formations, executing Immelman splits and barrel rolls.

'We've removed the control of flying ships from the user,' says **Alex Garden**, *Homeworld*'s creator and CEO of Relic Entertainment. 'Now the computer flies the ships and you just tell them what to do. It's enabled us to get an epic dog-fighting look.'

Homeworld is a cross between *C&C* and *TIE-Fighter*. Players build up massive space fleets, with motherships, research vessels, frigates and a host of smaller ships. Just as in *C&C*, success is achieved as much by skillfully utilising resources as by winning battles. Ships are given orders via the mouse in the time-honoured fashion, while pop-up menus keep the screen clear of clutter. Yet, as in *TIE-Fighter, Wing Commander Prophecy* and its peers, the action is 3D.

Several developers are working on truly 3D, realtime strategy games. They include Activision with *Dark Reign II* and Lionhead with *Black & White*, while Ubisoft and Take 2 have already had limited success with *Uprising* and *Armour Command* respectively. Other projects, like Maxis' first draft of *Sim City 3000*, have, unfortunately, been abandoned altogether.

Because *Homeworld* is set in space, Relic has the key advantage of not having to draw terrain. Instead, it's squandered processing

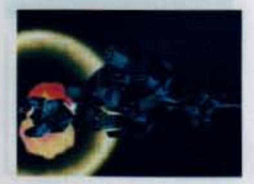
Format: **PC**

Publisher: **Sierra Studios**

Developer: **Relic Ent.**

Release: **November**

Origin: **USA**





Question marks still hang over the ability of *Homeworld*'s 3D engine to manipulate so many polygons at an acceptably fast rate





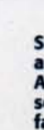
The mothership must be protected at all costs (top left). As the heart of the fleet, it creates all the other craft inside its spacious bowels



Vapour trails from passing ships are included to help judge their trajectory (above). In massive battles, up to 300 ships might fill the skies at one time







Ship design has been an ongoing process. After rendering up a second fleet of space-farers, the team went back and revised the first

power on drawing the recoiling and interlinking research pods. The level of detail is particularly impressive as *Homeworld* will usually be played from a distance. The screen displays dozens of fighters weaving around each other while frigates lob energy weapons from the perimeters.

'When I first got the idea for *Homeworld*, this is what I saw,' says Garden, 'a big, rolling ball of ships with vapour trails behind them. In the first non-disclosure agreement with Sierra, the name of the game was "Spaghetti Ball" – that's what I saw in my head!'

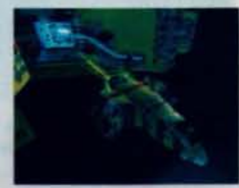
Like Cavedog's *Total Annihilation*, the shift to 3D graphics adds new dimensions to the gameplay. '*Homeworld* isn't actually played on a [linear] plane,' explains Garden. 'Being a 3D game, you can take the ships wherever you like. If you're attacking a capital ship... attack from underneath because it'll have to move its guns around to bear on you.'

Battles in *Homeworld* can involve as many as 300 different ships, all flying around in 3D. To help players coordinate their fleet, Relic has come up with comprehensive formations – another first.

'It's really important that you use certain formations,' says Garden. 'If you were attacking a capital ship, the claw formation gives you a much greater advantage than the standard delta formation, because you're able to come at it from all angles. Wall formation is often used with minelayer corvettes... to drop huge arrays of mines.'

As your fleet progresses across the galaxy (attempting to reach the eponymous planet of origin), it encounters rival fleets as well as pirates and traders, inevitably leading to conflict. In essence, *Homeworld* plays like a standard realtime strategy game, with asteroids and nebulae instead of ore fields, while research vessels take the role of advanced buildings. The sheer distance of space replaces the fog of war. Dots on the scanner may indicate meteors, salvageable derelicts or the vanguard of an enemy strike force. Spy probes and sensor arrays penetrate the gloom.

Currently, *Homeworld*'s flaw is its terrible framerate, which Garden says is now the main focus of attention. **Edge** also wonders whether effective strategy will be impossible to manage given the 3D nature of the gameplay. Certainly, though, *Homeworld* looks among this year's most exciting PC games. When even the resources are interactive ('You can hide behind asteroids or blow them into smaller asteroids as in the arcade game. You can send chain lightning storms down the arms of nebulas'), Relic seems to be taking nothing for granted in its quest to create something fresh.


The ships actually betray a surprising amount of attention to detail. Gun barrels pop out and whirl in a frenzy of polygons

VIVA FOOTBALL

Will the inclusion of 987 teams, 1,974 authentic kits, 16,224 players and 259,584 player attributes be enough to make *Viva Football* stand out from the crowd?









Over 300 stadiums have been recreated to ensure *Viva Football*'s authenticity throughout the ages (top right). The crowd plays an active part in the game, and won't hesitate to jeer at poor play from the Scottish side

By the time *Viva Football* arrives on the shelves of Electronic Boutique, most ardent football fans might have had enough. Jaded by the plethora of football games released this summer, they'll also have endured the most saturated World Cup coverage since, oh, 1994.

But Virgin Interactive reckons *Viva Football* is in with a shot:

'*Viva Football* is more like real life soccer than any other game,' claims Virgin Interactive's **Simon Humber**. 'It's got a very open-ended game structure. If you play something like *FIFA* or *ISS*, the gameplay is very much 'on rails'. The interface doesn't let you express yourself in a creative way.'

Viva Football aims to overcome this complaint with a control method that focuses on kicking strength as much as direction. Passes, chips and straightforward kicks can be performed either by quickly tapping the joypad – passing the ball towards a highlighted player – or else by holding down the button, which can send the ball anywhere on the field.

Players can thus kick the ball into space or chip it over defensive lines, adding to the authenticity of the game. While other football sims such as *ISS 64* have included through balls and the like, Humber says it's the extra level of control that will set *Viva* apart.

'If you want to kick the ball 50 yards down the field and then chase on to it, you can. If you want to play a short passing game, you can do that too,' he says.

Opening up the field with insightful play will count for little if players merely run back and forth along the pitch following preset paths. So Virgin has concentrated on making the players intelligent enough to spot opportunities as they arise.

'What goes on off the ball is just as

Format: **PC**

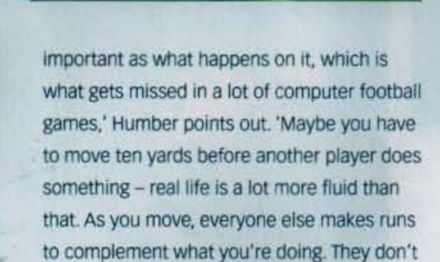
Publisher: **Virgin**

Developer: **In-house**

Release: **September**

Origin: **UK**





If *Viva Football* players are to exploit space more successfully, the camera may need to be brought back (above)



Virgin worked with Barnet FC for the motion capture. Not glamorous, but probably in keeping with the 'for the terraces' targeting of *Viva Football*. Players from four areas of the field were recorded, rather than just one star

important as what happens on it, which is what gets missed in a lot of computer football games,' Humber points out. 'Maybe you have to move ten yards before another player does something – real life is a lot more fluid than that. As you move, everyone else makes runs to complement what you're doing. They don't just react to what happens, they're proactive.'

Humber says that over a year was spent on the AI. 'Originally we thought, "why don't games look like football games?" and then we realised it came down to the use of space,' he says. 'We started simulating some stuff which analyses space on the pitch and after a few weeks it all fell into place.'

This proactive emphasis even filters through to the speech, with Virgin's PlayerChat audio engine replacing the stream-of-consciousness commentary of other titles. Players will shout for the ball, with phrases like 'To me!' and 'Through ball!'

Aside from the technical innovations, *Viva Football* also offers something a little different in its structure. Effectively a World Cup simulator, it covers every competition from 1962 to 1998, although the licensing minefield means Virgin must refer to them as 'World Tournaments'. The game was certainly intended to ship before the 1998 World Cup, but one advantage of the slip is that it has allowed Virgin to incorporate updated statistics from this year's World Cup into *Viva*'s vast database.

Indeed, *Viva Football*'s second strength is its comprehensive coverage of the last nine tournaments. Players can pit any team from any *World Cup* against another, and so resolve questions marks over, say, the superiority of England's 1998 team to the heroes of 1966. All the teams are faithful recreations, right down to the length of their shorts, which change in bagginess according to the decade. Early games are even played in black and white.

If Virgin's plans come to fruition, *Viva Football* could bring fresh ideas to a genre for which the phrase 'over-saturated' seems very understated. It might also bring shell-shocked football fans back for more. Now, that would be a remarkable feat.





Viva Football's 5,400 keyframes of character animation should help ensure smooth animations (above)



Football has changed a little over the decades. When playing with older sides, the ref adopts the home side's rules







DEEP FEAR

Saturn owners have reason to cheer with the arrival of a *Resident Evil* lookalike, set deep in Davy Jones' locker. Expect a heavily CGI-driven adventure that's more than worth its sea salt...





Although its textures are distinctly Saturn-esque – that is, lacking the sharp definition of their PlayStation equivalents – *Deep Fear* is an attractive game

Given the phenomenal success of *Resident Evil* in all major software-consuming territories, it's perhaps a mystery that few rivals have yet to appear. Sega's *Deep Fear*, then, has the unenviable distinction of being perhaps the first 32bit out-and-out 'horror adventure' to appear without Capcom branding. Comparisons are inevitable but, with Sega's title bringing some features to the genre, cries of 'cash in' may be accurate, if a little premature.

Foremost among these Sega-sired innovations is the effect that weaponry will have on different creatures. Each firearm – including a Colt 1991 A1, MP5, stun grenades and the common-or-garden shotgun – dictates how the player's foe meets their maker. There are up to ten different 'dying' animations on offer for every assailant that the player encounters.

Based inside a secret underwater US base, *Deep Fear* adopts a familiar, plot-driven approach to player progression, with CGI sequences accentuating the importance of certain events. Naturally, conserving limited air supplies is an essential consideration. **Edge** has yet to experience first-hand what effect this has on gameplay, but finds the inclusion of such a 'time limit' in an adventure game an intriguing prospect.

Due for imminent release in Japan, *Deep Fear* will no doubt enjoy an enthusiastic reception in Sega's home market, but has yet to be confirmed for UK release. While commercial success is somewhat unlikely on a *Bio Hazard*-type scale, a similar level of critical acclaim remains a possibility.

Resident Evil 2* aficionados may find the above shot eerily reminiscent of scenes found towards the end of Capcom's game...

Format: **Saturn**
Publisher: **Sega**
Developer: **In-house**
Release: **Out now (Japan)**
Origin: **Japan**







Prerendered CGI cutscenes are used, perhaps predictably, to further *Deep Fear's* considerable plot

MOTO RACER 2

A year after creating what remains one of the PC's greatest racing experiences, Delphine returns with a now-obligatory follow-up that looks set to overtake its predecessor







Along with improved visual effects and a track editor, *Moto Racer 2* should contain all of the gameplay values that made its predecessor so very playable



If anything, expect the setting to be even more varied than first time round, with players visiting the most unlikely of racing locations



Hopefully, this time, with its hi-res visuals and three multiplayer splitscreen mode, the PlayStation version will prove more enjoyable

Along with *F1 '97* and *Ultim@te Race*, *Moto Racer* was one of the first PC racing games to exploit 3D accelerator cards. The game proved a convincing advert for the emerging technology, with its detailed hi-res backgrounds, bi-linear filtering and speedy framerate. But now astounding accelerated visuals are the norm, so what can Delphine do to provoke interest in a sequel?

The first step has been to make the graphics even better. Like the original, *Moto Racer 2* presents a huge variety of circuits (eight location themes, each boasting five tracks), taking in everything from the countryside of Brittany, to the wilds of the Amazon basin and the desolate sands of the Sahara. Not only are they stuffed with scenic detail, but they also boast transient effects like snow, sunlight, fog and even tornados.

Perhaps more interesting, though, is the addition of a 3D rotating map editor. This seems to be something of a trend among racing game developers at the moment (see Europress' *Tommi Mäkinen Rally* on p98, for example), and has no doubt been inspired by the number of firstperson shoot 'em up map editors available. Whatever the case, it should add to the longevity of the title.

Beyond these features, *Moto Racer 2* does everything current gamers expect. The PlayStation version offers analogue control support, PC users have a number of multiplayer options to call upon, and both incarnations offer the usual choice between arcade and sim modes. Plus, like the original, the sequel offers a choice of speedway and racing bikes. With Milestone's more seriously intentioned *World Superbike Championship* also on the horizon, bike sim fans will soon be spoilt for choice.

Format: **PlayStation/PC**
Publisher: **Electronic Arts**
Developer: **Delphine**
Release: **September**
Origin: **France**





Just like the original, *MR2* alternates between smooth track racing and the rugged, sideways antics of motocross racing

DID GOES TO WAR

AFTER FORGING VALUABLE LINKS WITH THE MILITARY AND DEFINING THE STATE OF THE ART IN FAST-JET SIMULATIONS, WARRINGTON'S CODEWARRIORS ARE FLYING HIGH. EDGE REACHES FOR THE SKIES WITH DID FOUNDER MARTIN KENWRIGHT



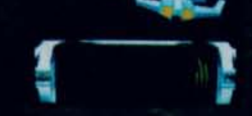




F-22 ADF (top row) is perhaps the best flight sim yet released on a home computer. DID has even succeeded in leveraging its proven excellence into military sim products for the Royal Air Force and the British Army (right)







DID's lineage stretches back to (from top) 1991's *F-29 Retaliator* and runs through to 1992's *TFX* and *EF2000*. *Epic* (above) was an uncharacteristic and poorly received foray into space-based action

DID's reception is graced with a pair of huge, ostentatious copper doors and decked with tasteful pine flooring and consciously stylish decor. It's more hip West End night club than game-development house, and all the more surprising given that it lies unassumingly in a converted warehouse deep in the heart of unsalubrious 'new town' Warrington. But this is the face of a market-leader in one of the most stable of the PC's staple genres – flight simulations. And, evidently, success is no stranger to DID. Enter **Martin Kenwright**, managing director of the company and perhaps the best-known human face behind flight sims in the UK.

Kenwright and other key DID staff originated at Rowan Software (creator of the seminal *Falcon* for the Amiga and ST) before forming DID in 1990. According to Kenwright, the group of 80 people he has assembled under the DID umbrella are 'probably responsible for virtually half of the flight sims written in Europe.' And, apart from brief dalliances with more mainstream arcade-style gaming (*Robocop 3* and the best-forgotten space shoot 'em up, *Epic*), it was that stalwart genre of the PC market where the company channelled its resources. 'Back in 1994, we conceived the idea of blitzkrieg development,' explains Kenwright, in a thick Mancunian-meets-Scouser accent. 'We threw over 20-30 developers on one product and finished it in nine months. I think only years later people perhaps realised just how unique *EF2000* was.'

In many respects DID's benchmark flight sim, *F22 Air Dominance Fighter* – released to international acclaim last year – naturally evolved from the company's efforts to professionalise and channel its creative resources effectively. Through its long-term links with the military, and by acquiring the associated British Standard accreditation necessary to get such contracts, the company has matured to a level far beyond that of most PC developers and its forthcoming projects are a manifestation of that. 'We were good at sims, and we quickly realised that winner takes all in this industry if you can get to be on top of a niche. And we've kind of done that with *EF2000* and *F22 ADF*. People are following us, we're not following them.'

WARGASM

One game on the lips of simheads at this year's E3 (if only for its provocative title) was this foray into the realtime virtual battlefield. *Wargasm* is perhaps DID's most ambitious project yet and implements a more arcadey style of gameplay targetted at a wider audience than its more typical PC output. Using a Risk-like global-domination sim that allows strategic and tactical control of forces, players choose between three types of combat – from a helicopter, a tank or on foot. And it's this variety of play styles that could make or break the title.

Wargasm's scenario revolves around the World Wide War Web (WWWW), a technological evolution of human conflict that now takes place in a virtual environment – bringing an end to real bloodshed. Complete with force-feedback controls, a 'Multiple Wargasm' multiplayer mode and some especially realistic rain, this game has the potential to be a contender for PC sim of the year – as long as the three different combat types do not result in a dilution of overall game content. If it does succeed, expect a flood of 'Fake Wargasm' titles from rival developers.

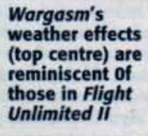












Wargasm's weather effects (top centre) are reminiscent of those in *Flight Unlimited II*

AN AUDIENCE WITH... MARTIN KENWRIGHT





Edge: PC flight sims are becoming ever more sophisticated, and yet ultimately they're still seen as entertainment. How did you manage to forge such strong links with the military?

Martin Kenwright: A phone call out of the blue from a company claiming to do military contracts, and who could use our 3D. We always said we could do PC simulators and from that we ended up retro-fitting the British Airways 737 simulator and a Jetstream simulator for RAF Innsworth. But the proper break came when the RAF called us direct and they'd been playing *TFX* and thought with a little bit of modification we could change some of our technology to fulfil their training needs. They told us it cost them about £10,000 to do a training mission, including fuel – just to practice dropping a laser guided bomb – and we could probably emulate it just as accurately by using a PC.

'THE RAF TOLD US IT WOULD COST THEM ABOUT £10,000 TO DO A TRAINING MISSION – JUST TO PRACTICE DROPPING A LASER-GUIDED BOMB – AND WE COULD PROBABLY EMULATE IT JUST AS ACCURATELY USING A PC'

Edge: How come you weren't seen off by the big boys in the simulation field?

MK: We didn't know it had actually gone out as an operational requirement and all these big companies out there were quoting half-a-million-quid systems on Silicon Graphics – and we knocked it together in three weeks for a few grand. It was called TIALDS – Thermal Imaging And Laser Sesignation System – and it was used in the Gulf. So the RAF were tickled pink. We invented TITS, as it was called – Tialds Interactive Training System – supplied all the Jaguar squadrons, and then we got the nod to do some of the Harrier squadrons in the UK. We're looking at doing the Tornado and going export with it.

Edge: It's surprising to think that PC technology could be advanced enough to satisfy military needs...

MK: The army had just been equipped with state-of-the-art Silicon Graphics systems, but the British infantry had simulations that were like ZX Spectrum simulations that they'd paid millions for – ten-year contracts from '86-'87. You couldn't even get the floppy discs that they used any more. They even had bits of string pulling targets across and they had to fire pellets through a sight that was linked to a great big tank barrel. That was the kind of stuff that the infantry had so I knew straight away then that we could do something on the PC that could piss all over everything in existence. So we went away and got together with former officers and a hardware company who actually built us real turrets for the different armoured vehicles.

Edge: So what pays better – real-life war or the videogame equivalents?

MK: The games. Military is very much a sideline. We do make

F22 Total Air War

In a move that has angered hardcore fans of the original, DID has re-engineered a planned expansion disc for *F22 ADF* into a full-blown game in its own right. *TAW* furnishes the highly advanced 3D engine with deep, complex war simulation mechanics allowing the player to be immersed in every aspect of a war, from planning tactics to flying into hazardous warzones. Now, as well as being a combat pilot, there is also the opportunity (should players so desire) to play the role of a tactical mission planner, a weapons officer, or even an AWACS commander. A new dynamic campaign offers the choice of ten wars over an area of 4.5 million square kilometers featuring accurate geographic detail from eight countries. If this wasn't enough, new multiplayer features include cooperative missions, custom combat and modem play.

Visually, the only noticeable advance that *TAW* has over its predecessor is the inclusion of true 3D clouds, providing realistic cloud layers and adding a new depth to strike missions and visual dogfights. Pentium II AGP support will provide extra horsepower to keep such environments moving fluidly.





***Total Air War* brings cooperative missions to *F-22 ADF* (right). The oneplayer campaign offers a choice of ten wars, with over 22,000 targets, 5,000 named cities and 300 airfields**

a very healthy profit but it's not enough to support a company as big as DID.

Edge: How do you split the resources of the company between creating games and doing military stuff?

MK: [illegible] engine and we've [illegible] such a way that the [illegible] teams will use it. [illegible] work is easier because [illegible] it's descriptive and it's [illegible] easy – whereas when we make games software [illegible]. A lot of our lads aren't into the military stuff, [illegible] they came to DID to make games.

Edge: So you haven't really diversified with the PC games you've been doing?

MK: [illegible]

Edge: Have you looked into the new Sega machine?

MK: [illegible]

Edge: So you're branching out on to the N64. What feelings do you have for that market?

MK: [illegible]

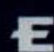
'WE'VE MOVED AWAY A BIT FROM BEING FANATICAL ABOUT POLY COUNTS AND WHAT WE CAN GET ON SCREEN. NOW WE'RE MORE FOCUSED ON DESIGN AND CREATING THINGS PEOPLE WANT TO PLAY. THINGS I'D WANT TO PLAY.'

Edge: Does the splintered PC market frustrate you?

MK: [illegible]

Edge: In the past DID was always about technology – sometimes at the expense of gameplay. What's the focus of the company now?

MK: [illegible]



Lethal Encounter (working title)

Considering the precarious nature of the cartridge market, it's perhaps surprising to find that DID's first console venture isn't for the PlayStation, but will appear on the N64. Currently looking like a cross between *Turok* and *Battlezone*, this blaster marks a departure for the company as it consciously harks back to its more action-oriented roots. The game employs a hackneyed scenario of aliens transforming the planet into a poisonous homeworld via giant terraformers laid beneath ancient historical sites such as the Incan city of Machu Picch, Angkor Wat and the Nasca Plains. The player takes control of an all-terrain vehicle equipped with enough weaponry to put a serious dent in these plans.

While the early demo that **Edge** witnessed revealed little more than a straightforward arcade blaster, DID's experience with deeper, more strategy-oriented gameplay could place it well to capitalise on the emerging trend for deeper, more cerebral arcade gaming to match the likes of *Battlezone* and *Metal Gear Solid*. Nowadays, trundling around in a tank blasting things simply may not be enough.







Lethal Encounter **recalls DID's early arcade-style games, *Robocop 3* and *Epic*. In thirdperson mode (main), the game is slightly reminiscent of Nintendo's *Starfox 64***





MOVE OVER, DARLING...

CREATE THE VIDEOGAME ICON OF THE DECADE

WALK AWAY FROM A FORTUNE IN ROYALTIES

DEVELOP 'THE GAME OF THE MILLENNIUM'

AND THEN TALK TO EDGE



The phenomenon of '90s videogaming, *Tomb Raider* dominated every specialist magazine and every store window for months on end, and reaped huge rewards for Derby's Core Design, where the game was born. Such is Lara Croft's popularity that Sony paid handsomely to keep her away from Nintendo consoles until the end of this century. Lara's face was everywhere, from pop videos to the cover of lifestyle magazines. But behind every great woman is a great man. Or in this case, two.

After creating Lara, her fathers abandoned ship in February '97, leaving Core – and a not-inconsiderable amount of royalty payments – behind them. Surfacing briefly to comment on the *Tomb Raider* spectacle for *The Face*, the lead artist on the game, the man responsible for Lara's gravity-defying breasts, disappeared. His name is **Toby Gard** (left). In equal partnership with **Paul Douglas** (right), *Tomb Raider*'s lead programmer, the pair have been busy setting up a new development studio, Confounding Factor.

Backed by Interplay and based in Bristol, in the south west of England (a short drive from **Edge**'s Bath HQ), the fledgling six-man team is hard at work, striving to create a title it confidently claims to be 'The game of the millennium'. It's a shock-factor tactic, however, angled to draw attention from aspirational programming talent. 'If you don't have high expectations of yourself and high goals, then there doesn't seem much point,' explains Douglas. Both he and Gard are serious about what they do, as might be expected from two men who have walked away from the shelter of a successful company to start an independent endeavour. They are, however, clearly enjoying their freedom, and with their new title *Galleon* they are on course to confound those sceptical about the company's credentials.

And so, settled within the spacious environs of Confounding Factor's ex-design studio offices (marred only by the dog-eared settee that defines the company's games playing area), **Edge** set forth to uncover the story of Toby, Paul and a girl named Lara…

Edge: A good place to start would seem to be your departure from Core Design. What was your impetus for leaving?

Toby Gard: It was just so we could expand and do something more. Core really got into the idea of the *Tomb Raider* franchise and we wanted to go off and do something different, I suppose that was the main reason. Maybe a little bit of creative differences, but nothing major. We just wanted to branch out on our own.

Edge. Was it a difficult decision to make?

TG: There was a lot of money to be left behind, but we had to make that decision. It was a hard one but I think we have made the right one, to go out and do our own thing.

Paul Douglas: At the end of the day we wanted to do games, not just sit there and rake in the cash. We were already getting bored of just sitting there for two months twiddling our thumbs. So as you can imagine we were eager to get on and do something. It wasn't happening at Core.

Edge: What was Core's reaction to you leaving?

TG: They were very upset.

PD: In fact, they stopped our money… But maybe we shouldn't go into that.

TG: Yeah, they weren't very happy.

PD: They paid one month's royalties and then stopped the cheque at the very last second. It went in to my bank and then came out again.

Edge: Did you get any royalties at all, then?

TG: While we were still there, yes.

PD: Just not February's.

Edge: Do you have any regrets about leaving, apart from the money?

TG: Yeah, I think so. Some. There's lots of friends that have been left behind up there, a lot of social life we enjoyed.

PD: Mainly the money, I think…

TG: Well okay, that's Paul. I kind of liked the people as well. Derby wasn't particularly exciting. It was a good place to work, it was relaxed and there was a good bunch of people.

Photography: **Nick Wilson**

GOING UNDERGROUND

As chronicled in E48, Confounding Factor was part of a mass of new, independent developers. Joining ex-Rareware staff (Eighth Wonder), famed videogame guru Peter Molyneux (Lionhead), and past members of Bullfrog (Mucky Foot), Gard and Douglas were part of a trend that is spreading throughout the videogames industry. Creative individuals are beginning to tire of having to operate under the banner of a publisher, searching for both recognition and independence.

After a long stint in the limelight, the big companies are having to move over for brighter stars, newcomers intent on delivering maximum gameplay to the ever-expanding market. This pattern hasn't ended either, with new mutations arriving each month. Cooperative groupings of small developers are currently hot news, a trend embodied by the US-based Gathering of Developers (GoD, subject of E60's 'An Audience With…'). But did Gard and Douglas feel it was a coincidence that so many talented individuals decided to go it alone around the same time?

TG: I think that it is going that way. Fragmenting down into small groups which are concentrating purely on trying to make good games. I think that it's a really positive way for the industry to move. They have no management coming down from above telling them what they're doing isn't going to be viable. The only thing they have to do is sell it to a publisher, and the publishers treat you with a lot more respect when you're a small company rather than just an employee.

PD: I think it was just a consequence of all the big money coming into the game. That's obviously not gone down too well, forcing the 'creatives versus accountants' sort of thing that's happening in a lot of the bigger companies.

Edge: Did it ever feel as though you were part of a 'movement'?

TG: We don't really know any of the others. We consciously made a decision not to keep up with what was happening in the games industry, just to have a break from it all. It was quite good to get away, because with the success of *Tomb Raider*, everyone was wanting to know what happened to us, so we just laid low and had a bit of a life.

Edge: What would you say has been the greatest gain of striking out on your own?

PD: It's just the freedom, I think.

TG: We're paid a lot less here, and we are having to do a lot more work…

PD: The environment is a lot more creative. People here are interested in what they are doing.

TG: Not that they weren't at Core, you understand [laughs]. It's just the feeling of being somewhere that's…

PD: … going somewhere.

Edge: Did you have any problems finding a financial backer?

PD: Not at all. We had a fairly good game under our belt so it was easy. I think a lot of other people have had problems. We were very lucky.

Edge: You've chosen to start this new, independent life a long way from Derby. What brought you to Bristol?

TG: Because there are lots of things to do, because there are places to go…

PD: And because we thought Bristol deserved a premiership developer [laughter all round].



Confounding Factor, left to right: Andrew Howe (programmer) Kevin Pateman (programmer) Toby Gard (creative director) Matt Bell (3D artist) Paul Douglas (technical director) Not present: Chris Tector (programmer)



Meet Rhama. He is gifted with a vast ▼



range of movement; running, climbing, ▼



swimming and picking up objects smoothly





Although these are workstation renders, the polygon count is well within the means of PC 3D accelerators. The lighting is less so

VIDEOGAME PIRACY

It's in its infancy, with a release date cast out to the far side of Christmas, but Confounding Factor has a game. And it looks like it could be good. Very good, even. *Galleon* is a pirate adventure in which the player guides the (*male*) character Rhama around a series of islands. Thoughts of LucasArts' *Monkey Island* series should be banished; there are no wise-cracking skulls in Galleon, just vast environments set to be filled with testing conundrums. At the time of **Edge**'s visit, Rhama could be seen pounding through semi-textured landscapes, confirming that the animation, at the very least, will be top-notch.

Confounding Factor has a problem, though. Whether the public knows it or not at the moment, every videogame publication is going to be shouting about *Galleon's* parentage. Lara Croft will cast a curvaceous shadow over proceedings, requiring Rhama to use every ounce of his muscular movement to outrun her. ▶













One of Galleon's innovations is the ability for Rhama to lock on to objects, enabling him to run past, grab an item and start using it in one single, smooth motion. The system is also used for combat, with the player guiding the character rather than its attacks – as in Tomb Raider. However, all weaponry will be blade rather than barrel based

GIRL POWER

She's outlived the Spice Girls, and retained an element of credibility despite her objectification by mainstream and specialist media alike. Amid the now-settling furore that engulfed Lara Croft, it has almost been forgotten what her character represented within the gaming world. Buxom babes have always been a factor in a market that caters almost exclusively for men, but none had ever combined brains with beauty. In hindsight it now seems an obvious move, although Gard claims that Core was reluctant to allow the development team to use a female character.

But while *Tomb Raider* would never have succeeded as it did without Lara, so she would have faltered without a strong game to saunter through. Mainstays of that cavernous environment, Gard and Douglas still harbour strong feelings for the woman they had to share with the whole world.

Edge: What are your views on the *Tomb Raider* series now?
PD: It's good, but I think they need to really seriously consider its direction. I don't think they can constantly keep churning sequels on that engine. They should take Lara in different directions – whatever those directions are – I don't really want to give them any hints. They should really try and push her out into different genres. *Tomb Raider 2* was quite fun...
TG: Hard. Too hard.
PD: And too much shooting of human bad guys.
Edge: Do you think *Tomb Raider 3* [announced at E3] is a step too far?
PD: I think it's come out too quickly, they should have left it. This year we've had *Tomb Raider 2*, and now the budget release of the first one, and then it's straight into *Tomb Raider 3*. They should have waited a bit, got people really up for it, wanting it. But Eidos needs it. What triple-A releases has it got this Christmas?
Edge: You've been quoted in the past as saying that the game is always more important than the character. Do you think that's still true of *Tomb Raider*?
TG: Well I still think the character wouldn't have been anything had it not been a good game. I really do believe that. At the end of the day you can say that she had a lot of personality, but that came out through the game. She's quite attractive looking, in a bizarrely formed way, but just that wouldn't do it. It needed a good game and after that people could latch on to the character. Just like a film actor, you can like them but they can still do a crap movie.
Edge: Did the marketing of Lara and *Tomb Raider* ever get you down?
TG: Yes, she was meant to be untouchable, to be this demure person – that was the whole concept, really. And so some of the more down-market marketing did get us down while we were still there, but now they can do what they like, it's theirs! But they did a good job at the end of the day, didn't they. Whether or not it was as sexist as some of the marketing is, is neither here nor there when you are talking about that sort of money I suppose. ▶



FUTURE FACTORS

Outside of the creative freedom that leaving Core Design has given Gard and Douglas, and beyond the evening-hour recreation on offer in Bristol, longer term benefits are becoming tangible. Personal freedom has been a welcome facet ('to not have a bollocking if you come in at quarter to ten instead of half nine,' grins Paul), as is being in control of their own destiny (although Gard reckons it's 'scary as well'). There have been trade-offs, as Gard admits ('things took longer than we expected to set up, to get done'), but overall Confounding Factor is engulfed in a positive atmosphere. Gazing into the future is often a fruitless occupation, but **Edge** was interested to find where the company's compass was pointed, aside from the short-term search for final members of staff.

Edge: Would you like to see a situation where Confounding Factor was producing multiple products, or do you think you will always be a one-game company?

PD: Eventually we'll move to two teams. I think from a technical aspect I'd like to get people working on pure R&D, which is something very few companies do. We can have a team that go off and use an engine that has really been pushed forward by others. While some people will just be working purely on technology, others might be working on the actual gameplay.

Edge: On a personal level, what are your ambitions for Confounding Factor?

PD: Get rich quick and retire [laughs].

TG: I want a Ferrari for every toe I have… I think it would be great if everybody who came and worked for us could make a load of money and could all feel like they'd worked on something that was really cool. That we can have a really super-cool place that people want to come to. Where we can make really fab things and never compromise on quality, in the way that Molyneux does – which is why he's such a hero.

Edge: You've said in the past that being a game designer is about as cool as working in an abattoir. Do you feel like that situation is improving?

TG: I doubt it somehow.

PD: Who's defining cool? It's not really, though, is it?

TG: I suppose it depends. The PlayStation is bringing it into a broader market. I don't think it will ever be cool. At least you can get accepted, and not get quite as many funny looks from 'normal' people these days. Most people go, 'Oh really? That's nice.'













This attractive redhead (left) is Faith. She plays a 'major part in things', appearing at intervals throughout the game. Environments will be interactive, which are under construction (right). Rhama poses with his yet-to-be named sidekick, who'll be directable (top)

◄ continued

Edge: Do you think it will be difficult avoiding the *Tomb Raider* factor, in terms of press and public opinion?

TG: I don't think we will, not when we start showing it around. We're not under the shadow of *Tomb Raider* really, because nobody really knows about us – until this interview comes out. I don't think we'll have a problem with it because what we are doing now is much better than what we were doing at Core.

Edge: You're developing only on PC at the moment. Given the supposed compatibility between the two platforms, is Dreamcast something you would be interested in?

TG: There are discussions going on at the moment…

PD: But if we do another platform we will have to get a lot more people in, and we might start slipping our PC release date.

TG: It's a bit up in the air really. We only spoke to Sega recently, but it's a really nice machine, obviously.

Edge: Is there any particular aspect of *Galleon* that you feel is breaking down expected boundaries?

TG: There is an awful lot of things we are really expanding, to break beyond the limits of anything else. There are so many 'unique selling points', or whatever you call them in strange marketing terms. The fighting…

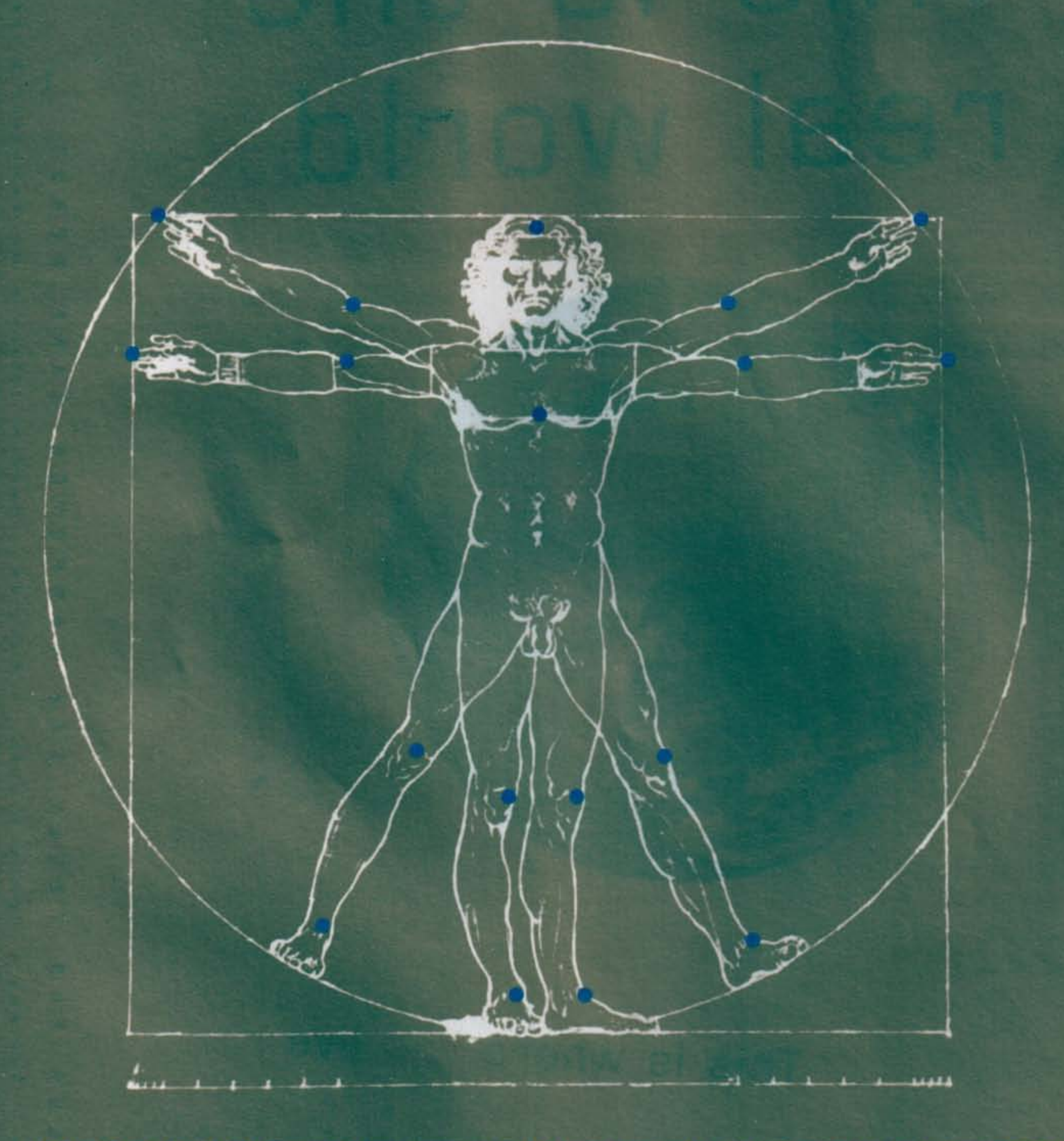
PD: … the user interface, so that it can give a newcomer as much satisfaction as someone who has played it for hours. They can get into it in a couple of minutes, that's the most challenging thing. I think it is a really overlooked aspect of game programming in this 3D world. It's your user interface, much more than your cool graphics engine. *Tomb Raider* had a fair control system, but we're moving a lot further on than that. That's my goal.





Although a playable version of *Galleon* clearly exists (far left), Confounding Factor is reluctant to release realtime images until later in development. Given the lack of texture maps, it's understandable

MORE HUMAN THAN HUMAN



Ridley Scott's 'Blade Runner' foresaw artificial humans walking the streets by the year 2025. In 1998, videogame developers are working to replicate convincing human beings on computer screens, and the fruits of their endeavours are edging ever closer to reality...

An interesting theory has been circulating Hollywood recently. It suggests that in a few years' time, filmgoers will no longer be able to tell the difference between real actors and computer-generated characters. The cynical may scoff, but the foundations are already in place. 'The Crow' director Alex Proyas, for instance, famously used computer technology to finish Brandon Lee's scenes after the actor was killed on set. James Cameron filled his Titanic with polygon passengers – not too realistic close-up, but perfect for those dramatic tracking shots. There's a long way to go, but the SFX Holy Grail – believable synthespians – is in sight.

However, the movie special effects crews are not alone in their pursuit. The videogame industry has, in a more modest way, been attempting to portray realistic human characters for the last 15 years. Along the way, there have been some notable landmarks – the excellently animated agent in *Impossible Mission*, the rotoscoped fluidity of *Prince of Persia*, the multifaceted Conrad from Delphine's *Another World* – but these were all victims of limited processors, low-res graphics and relatively paltry colour palettes.

So what stands in the way of today's videogame artists, and what advances are being made towards creating totally believable characters? Edge investigates...



Could a CGI end-sequence from *Tekken 3* (such as this) hint at the quality of ingame characterisation of the future? While currently relying on motion-capture techniques, many believe this is the shape of things to come

Why does Mario wear dungarees? Modern gamers would answer it's because he's a plumber, and plumbers wear dungarees. A few miscreants may even suggest it's just a sartorial statement, or that he wears them because he's a cute character. They are all wrong. Mario wears dungarees because, when the original low-res sprite was designed, it was the only way the artists could make his arms look separate from the rest of his body. Mario did not start out as a plumber – technology made him that way.

This is by no means an isolated incident. The development of human characters in games has always been shaped as much by the limitations of the hardware as it has by the imagination of artists. In some ways, this is still the case today. According to Gavin Rummery, lead programmer on *Tomb Raider 2*, Lara doesn't wear a backpack as a highly practical fashion accessory – it's there to hide a join in the 3D model. For *Tekken 2*, programmers had to cut down drastically on textures to retain a smooth frame rate. The characters in *Nightmare Creatures* (see p97) were originally meant to have flowing hair and clothes that ruffled in the wind. Current technology just couldn't cope.

Hardware hurdles

It's not hard to pin down the hardware culprits responsible for these compromises. **Peter Ryce** at Alias|Wavefront proffers:

'I think one of the largest barriers for realtime games has been the limited horsepower and resource space available on delivery platforms. Based on the number of polygons a game engine can push around in realtime, characters have typically been quite low resolution, more so when you have numerous characters – as you might find in a sports sim. The limitation extends beyond just the number of polygons, though, to the amount of texture space and the amount of animation data that can be managed.'

Even in the next-gen age, then, artists are continually fighting with hardware. A lack of processing power means they have to keep polygon models as simple as possible so that the computer can move them about the screen with anything approaching speed. Concurrently, a lack of RAM reduces the number of animations each character can call upon, in turn reducing how smooth and realistic their movement looks as they walk, climb and jump about the game world.







Game characters are often the victims of compromise: Lara's backpack hides a join in the 3D model, *Tekken 2* trades texture detail for speed, and *Quake* (above) neglects human design in favour of advanced environments

Tony Wills, motion-capture studio manager at Gremlin, makes the difficulty of the task clear:

'By far the biggest barrier to creating realistic movement for human characters in games has been the complexity of the human body and the way it moves. An artist trying to generate animations based on their own experience and knowledge of the way we move has a mountain to climb. Replicating a movement one has seen or imagined is hard enough in person, never mind using a mouse or keyboard...'

Which is perhaps why, for the past few years, attention has been so rigidly fixed on creating realistic 3D environments. Games like *Quake*, *Unreal* and, more recently, *Forsaken* have all been exploring techniques such as bi-linear filtering, realtime/coloured lighting and transparency to construct staggeringly believable and complex locations, but this has often been at the expense of human characters – the marines in *Quake*, for example, can look almost as 2D as their bitmap *Doom* predecessors. In fact, in the West, most character-based games are currently based around intentionally stylised, comic book entities. You can't complain that *Crash Bandicoot*, *Gex* and *Croc* don't look realistic, because they're not meant to.



New vanities

Given these difficulties, is it actually worth developers trying to create realistic human characters? Does believable human ▶

◀ animation add to the videogame experience? The area is fraught with ambiguities – as Tony Wills clarifies:

'The point at which you stop one animation and start another is tough to choose. Chop and change animations too readily and the game may look jerky and unrealistic. Leaving animations playing longer may look better, but game characters do not respond to events as quickly as desired.'

This is a valid point. Lara Croft can now call upon some 5,000 different animations, and Core programmer Rummery

'The biggest barrier to creating realistic movement for human characters has been the complexity of the human body and the way it moves' Tony Wills, Gremlin

admits animation is *Tomb Raider 2*'s biggest memory hog – yet many players feel the extended realism of Lara's movement is a time-consuming hindrance. Similarly, in the first football sims to use motion capture, the footballers couldn't respond quickly enough; they were still completing elegant manoeuvres long after the ball had been taken from them and booted down the other end of the pitch.

But these difficulties are not a good enough reason to abandon the search for true game humans. For a start, not everyone finds Lara frustrating – as **Lee Carus**, studio art director at Psygnosis, confirms:



Lee Carus sees two contrasting approaches to character design, symbolised by the *Prince of Persia* (left) and *Mario* series' (right)

'There are two schools of thought on character animation. There is the *Mario* school, and the *Prince of Persia* school. The *Mario* school demands instant response to a user keypress. The *Prince of Persia* school says an action will take place when the body is physically in a position to be able to do it. I think both schools are entirely valid and represent different types of gaming experiences.'

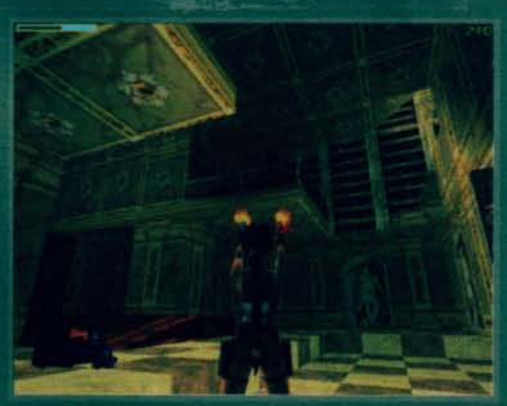
Carus is right, of course. The first thing many gamers remember about titles like *Impossible Mission* and *Prince of Persia* are the amazingly lifelike characters. Realistic animation is part of the immersion experience – it's part of what pulls players into the game world. Interestingly, when *Tomb Raider 2* was first being previewed, intricate elements of the new title were often overlooked – but every preview mentioned Lara had a realistic ponytail. Despite what a few dissenters may say, Ms Croft is testament to the fact that humans sell games. Especially if they look good in shorts.







Flexibility is considered to be an important part of character design. Lara Croft and Mario can both swim, while the characters in *ODT* (above) can leap out and swing from pipes



Although the environments in *Tomb Raider 2* are highly detailed, Lara Croft herself is the main memory drain with 5,000+ animations at her disposal

Character led

Developers are certainly not ignorant to the importance of realistic human characters. In a typically evangelical and impassioned address at this year's Computer Games Developer Conference, Shiny's **Dave Perry** made it perfectly clear how important this aspect of gaming is going to become.

'Many teams, when they start an engine, just worry about walls and lighting – they add their mannequin characters as an afterthought... Characters are extremely important in games. They are the thing you look at most; they deserve the attention of your best, most creative staff. The more real they are, the more real the worlds are, and the more they can suspend my belief. It's a Holy Grail that Shiny is investing millions of dollars into researching. Our *Messiah* engine is Shiny's first step into this next evolution of character technology.'

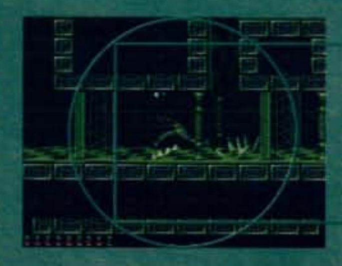
So, given the apparent technical restraints, what exactly can developers do to create more believable ingame humans? Well, conveniently, many of the traditional problems are beginning to fade. A high-end Pentium can

BECOMING HUMAN...



1985 IMPOSSIBLE MISSION

Epyx's 1985 platformer was the first to portray realistic human movement. The fluidity of the secret agent as he ran and jumped through each screen was hugely impressive. Figures brought to 'life' with just four or five frames would never be acceptable again.



1989 PRINCE OF PERSIA

Jordan Mechner's game used rotoscoping (early 2D motion capture) to introduce a new level of flexibility to the digital human, allowing him to grab ledges and climb, rather than just run and jump. The game attempted to immerse the player in a totally interactive world.

Sport sims are making important contributions towards advanced character design. Football titles like *Actua Soccer 2* (below) use detailed textures to create replica kits, and advanced motion-capture techniques to perfect player movement. The designers of *NHL '98* (right) have attempted to construct realistic player faces





now process in realtime pretty much all the textures and polys an artist wants to throw at it, helped along by specialist 3D cards which deal with most of the 3D-model calculation and texturing. In terms of RAM, too, 32Mb is becoming standard – more than enough to cope with even the most heavily animated characters.

Capable consoles

Consoles aren't being left behind completely, though. Specialist hardware, such as the PlayStation's geometry transfer engine, allows for the speedy manipulation of textured 3D models, and the lack of onboard RAM can be countered by clever data compression techniques. As **Edge** revealed in issue 57's PlayStation supplement, King's motion data is three times larger in *Tekken 3* than in *Tekken 2*, even though the artists felt they were pushing the machine to its limits in the latter. Furthermore, PlayStation 2 will no doubt include enough hardware to put even a Voodoo 2-carrying P300 to shame. Power, it seems, is no longer a problem.

Evidence of this is everywhere. Take model complexity for example: the players in *Actua Soccer* were made up of just 25 polygons, whereas in the sequel they vary between 80 and 250. How was this possible?

'The original *Actua Soccer* required a method which allowed us to generate realistic characters containing a minimal number of polygons in order that it would run on a 486, in 4Mb of RAM,' explains Gremlin's software manager, **Tim Heaton**. 'At the start of *Actua Soccer 2* we decided the base machine would probably be a P100 with 16Mb, which gave us scope to be more creative with the character models.'

Texture-mapping has also become a more exact science of late, says Lee Carus:

'It is often the case that you'll have a wonderfully animated character that just doesn't look right. Many times this is down to badly defined materials. A common manifestation of this is "shiny face syndrome", where your character's face looks like it's made from soap. New shaders and more complicated texturing procedures are now combating these ill effects.' Advanced texture-mapping is perhaps most visible in the beat 'em ups mentioned previously, but they are also prevalent in sports games where developers are attempting – and succeeding – to copy the minutiae of team strips.

Even more impressive are current endeavours to create realistic faces. For *GoldenEye*, Rare grafted photographic images of real actors on to the ingame characters, but the effect was a little flat and blurry. In *NHL '98*, however, the designers have used a proprietary method to give each player's face more 3D shape. **David Warfield**, senior associate producer at EA Sports, explains:

'It is a process that takes a player's photo, identifies the key structure points on his face, and stretches it over the top of a 3D player head shape. By identifying key structure points we even can make the player smile, grimace and blink.' Hollywood take note...

But building a complex model and slapping hi-res textures all over it does not constitute a realistic human. It may look great when it's standing still, but what happens ▶









Realistic skin animation is a hot area for game artists at the moment. Iguana US, for example, has created a new skin system for *Turok 2* to enhance the many dinosaur models. 'Basically, the entire outer skin of each creature is flexible,' says Iguana's **David Dienstbier**. 'The vertices stretch and pull, and that also stretches and pulls the texture maps applied to the model. The result is very lifelike and subtle'



1991 ANOTHER WORLD

Taking its cue from *Prince of Persia*, Delphine's atmospheric platform adventure featured another gymnastic lead character, capable of leaping, swinging and running with incredible realism and surrounded by more intricately-realised environments .



1993 ALONE IN THE DARK

Edward Carnby might not go down in history as one of the most attractive videogame protagonists, but he was an important early example of polygonal character design. The jump into 3D arcade adventure inspired many imitations, among them *Resident Evil*...

when it begins to move? This is where motion capture has become the primary tool for animators, bringing totally realistic 3D movement to videogames for the first time. There are some incredible examples of motion-captured work around at the moment. The beautiful, supple movements of the fighters in *Tekken 3* as they shadow box before a bout is a shining example: the Namco team used two real martial artists to capture the moves; they even made sure one was an expert in Capoeira-based combat,

'We will definitely get to the stage where the creatures have musculature, bones, a nervous system and high and low level AIs' Chris Hecker, coder

so that every fighting style looked true to life. The effort certainly paid off. Every part of every fighter's body appears alive and ready for combat, with muscles tensing and fists clenching as the characters warm up.

However, everyone that uses motion capture recognises that it isn't a complete solution in itself, as Ryce argues:

'For many purposes motion capture is an excellent way to get realistic human motion, but it does have some issues. Motion-capture data is typically very dense – far too dense to be represented in a game engine. Because of that, we need to reduce the data that gets imported, but not so far as to eliminate the subtleties of the captured motion. Also, motion capture is very sparse with respect to secondary motion. It typically captures the overall motion of a character, but doesn't capture many other fine details. This requires the attention of a trained artist.'






All characters begin as wireframe skeletons to which detail is added in stages. But programmers are becoming interested in the skeleton itself. They want it to react to surroundings in realtime



The tessellation engine used in Shiny's *Messiah* has been programmed with a thorough understanding of human anatomy. Is this the future?

Dynamic characters

Perhaps more importantly, though, a motion-captured character is something of a mannequin; it can't react to its environment in realtime. In *Resident Evil*, for example, Jill Valentine can't shoot a zombie and then walk over it – she walks through it. Similarly, as great as the characters are in *GoldenEye* they do have a habit of thrusting their shoulders through closed doors. In fact, videogame characters are forever putting their arms through walls, obstacles and each other. Motion capture alone can do nothing about this as it is just an animated sequence drafted on top of an environment. **Chris Hecker**, a veteran coder and respected authority on ingame physics, puts it another way:

'Motion capture sucks. It's just a fancy way of getting an animation loop into the computer. It doesn't tell you anything about the dynamics of the movement. What does a motion-captured animation do if one of its limbs hits something or gets tied down? Nothing. It either continues the animation and looks stupid, or it stops playing the animation and looks stupid.'

Even motion capture professionals recognise this as a problem. However, they do go as far as to suggest constructive solutions.

'There are several ways to crack this,' asserts **Nick Bolton**, project manager at Vicon, who makes motion-capture systems for the videogame and film industries:

'The "duh" approach is to capture the actor responding to those obstructions and physical contacts. This is what they did for *G-Police* and *Batman and Robin*. The second way is to include interaction and responsiveness as part of your game engine. Here the character is principally controlled by the motion capture data, but when an obstruction comes along, the game engine overrides that data and forces the interacting segment away from the object.'

This is certainly the direction a lot of animation R&D is going at the moment. In fact, several developers are already producing dynamic characters; characters that respond to the world around them, and interact with it on the fly. Appeal's forthcoming action adventure, *Outcast*, for example, employs a currently fashionable system named 'Inverse Kinematics' – essentially a series of algorithms which can control the skeletal structure of a character, in realtime, in relation to its environment. So now, when Cutter, *Outcast*'s hero, is walking through one of the game's



1993 VIRTUA FIGHTER

In the early '90s *Virtua Fighter* presented the glorious world of the polygon with its arsenal of fighters in true-3D. Sarah Bryant and co may look simplistic now, but if this game had failed, *Tekken*, *Soul Blade*, *Star Gladiator* and *Tobal* might never have been. How's that for seminal?



1996 TOMB RAIDER

Lara Croft is one of the most important characters in videogame history, giving players an incredible amount of control over a complex environment. Despite its faults, *Tomb Raider*'s brave new 3D world reminded developers that realistic human characters could sell.



If the player is to believe in the character, the latter must react to pain in a believable way. In *Resident Evil 2*, Leon and Claire will begin to limp if injured, while in *GoldenEye*, characters act differently when hit, depending on the impact area







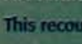
Players are instinctively impressed by believable character animation – which is perhaps why it figured so prominently in Sega's DreamCast presentations. The spinning Soichiro Irimajiri demo and the early shots of *D2* both showed off incredibly realistic character design. Viewers equate this with impressive processing power. Sega's job is done

several voxel-based environments and he comes across a raised floor surface, the IK algorithms work out the difference between the usual surface and the new one, and alter the footstep animation accordingly. No more walking-through-objects misery.

Messiah, too, uses anatomical techniques, but it has no choice. The game features a realtime tessellation engine which reduces or increases a character's visual detail as it moves further away – or nearer to – the player. Unfortunately, if the engine only had external polygon data to work on, it may decide to lop off a shoulder or leg when a character is in the distance. So Shiny came up with an alternative means of storing and generating human characters.

'And that means a storage format where you describe how important every part of the body is,' explained Dave Perry at CGDC. 'Basically, you need anatomy rules and regulations. The final engine has to fight to save that nose by stealing polygons from under arms, behind the back, until the last possible instant. When you don't worry about anatomy, the result of these equations tends to be a character that seems to boil as they move in and out of the screen. Using our method, each of the characters in *Messiah* are modelled in about 500,000 polygons in *3D Studio Max 2* before they are anatomically compressed.'

Art forms



This recourse to the skeleton is a natural way towards realism. Leonardo da Vinci intricately studied the internal anatomy of the human body, believing an understanding of the structure of the muscles, the skeleton, and so on, would give his painting more realism. Videogame designers are doing the same thing. As far as motion capture is concerned, the skeleton of the character is a simple stick diagram – a vessel to hang the polygons from and forget about. But today's artists and programmers are attaching physics to the skeleton – they are including routines to manipulate the character's posture and movement. They want it to react to its environment, to take longer steps downhill, to make shorter steps when unsure of the ground surface, to limp when injured. Motion capture is not the be all and end all of realistic animation. It is a tool rather than a solution.

New software is aiding this move towards skeletal precision. Alias|Wavefront's revolutionary 3D art package *Maya*, includes an anatomical development tool which can be used in both CGI sequences and realtime games.

'Things like the way a character walks, including all the wrinkling of the surfaces at the knees, the amount of hipsway, spacing of the feet, etc, can be built into a character using deformations that are related to inverse kinematic bone movement, and spacing of feet can be a mathematical expression based on hip position, etc,' asserts Peter Ryce. 'By preparing a character properly, an animator can concentrate on the basic motion of the character and rely on the encapsulated behaviours to generate the convincing secondary motion.'

In other words, through software like *Maya*, design teams are now able to build characters with complex, ▶



1997 TUROK: DINOSAUR HUNTER

The dinosaurs inevitably stole the show, but *Turok's* tribesmen are amazingly lifelike and highly detailed. There are some great death scenes, too. Shoot the attackers in the neck and they grind to a halt, grab their spurting juggulars and sink to the ground. Gratuitous fun.



1997 GOLDENEYE

In Rare's tense, atmospheric world, the soldiers roll about to avoid fire and Natasha shakes her head and thumbs her chin while hacking into computers. More importantly, though, soldiers react differently depending on where you shoot them. It's addictive realism.



Outcast (above) and *Grim Fandango* (right) both employ procedural animation to make the lead characters respond to their surroundings

multifaceted skeletons, and skin which reacts to those skeletons. At the moment the techniques are in their infancy. In the future, characters' real muscles will flex and when they're attacked they will take real injuries to different parts of their bodies. These injuries will directly affect the character's movement – a notion that's been explored in *GoldenEye* and *Resident Evil 2*, but will become more complex as the software creates a more user-friendly process.

'Weight, tension, muscle, strength, fat quantity, haircut – all of these will soon be introduced to make the digital puppet react properly' Franck Sauer, Appeal

And it doesn't end there. Developers are also looking into methods of getting characters to react to the world in a highly visible way. 'Procedural Animation' is a method of taking information from the environment and applying it to the character in realtime. This can have a number of uses, as **Franck Sauer**, artistic director on *Outcast* explains:

'Cutter's head has a procedure that measures the height of an object and rotates the head's X axis to match the direction of the object. It now looks like Cutter is concerned with his environment.'

LucasArts uses a similar effect in *Grim Fandango*. When the lead character, Manny, enters a room, he automatically looks around for anything relevant. According to **Tim Schafer**, creator of *Full Throttle* and *Day of the Tentacle*, this has two uses:

'It indicates objects of interest within the room without using intrusive cursors or icons, and it also gives Manny this appearance of constant alertness as he walks through the game environment.'

Again, this is an area Alias|Wavefront has looked into with *Maya*. Peter Ryce explained that the software includes a scripting language called MEL (Maya Embedded Language) designed to help artists create procedural animations and complex relationships between different animations:

'You could create a script that uses a random function to blink the eyes of a character every so often. This type of animation relieves the animator from having to remember to add all the secondary motion, after they have created the main character motion, and it certainly adds to the realism.'





The CGI sequences which accompany games like *Ultima IX* (top) and *G-Police* hint towards what ingame characters may look like five years from now. Technology today is no longer a barrier

In effect, the system enables artists to add layer upon layer of detail on to their characters and then manipulate and direct the whole lot in one go, making the process much easier. And the easier it gets, of course, the more likely we are to see characters that toss their hair, clench their fists, look around, and make other realistic secondary movements.

Widescale use of dynamic characters is still a long way off, though. The process is time consuming and processor intensive, so progress is likely to be slow. As computers get increasingly powerful, more developers are likely to explore procedural animation, realistic skin, and motion capture which incorporates inverse kinematic functions. Franck Sauer certainly believes games are heading this way:

'Characters will soon become autonomous digital puppets – things that stand, walk, run and fall, all with real physics. Following the introduction of real skeletons, more information about a characters' intrinsic qualities will follow. Weight, tension, muscle, strength, fat quantity, haircut – all of these will soon be introduced to make the digital puppet react properly.'

Chris Hecker believes game characters could almost come to resemble living, thinking organisms:

'We will definitely get to the point where the creatures have musculature, bones, a nervous system, and high and low level AIs, where the high level AI will think about things like, "I want to go forward" and the low level AI will be a controller that says, "okay, I need to put my left foot forward without tipping over this stack of things I'm carrying." If you look at some of the research in this area you see some amazing stuff, like Karl Sims' virtual creatures. He breeds creatures that teach themselves how to swim, walk, jump, fight and so on. They're incredible, though still rudimentary.'

By attempting to create a virtual Tom Cruise, then, Hollywood is setting its sights rather low. What game designers have in mind is far more interesting – characters that react in realtime to their environments, stepping over obstructions and examining interesting objects, characters with expressive faces and real, physics-based bodies that are susceptible to injury, and bleed. Videogame artists are the Frankensteins of the 21st century. Their monsters are waiting just around the corner...

Motion capture: the way ahead?

Just three years ago, motion capture was on the periphery of game design – the preserve of only the richest developers. Now it has become an almost arbitrary element. But, as is often the way with burgeoning technology, there's more to come . . .

For those who have been living in a cave for the last two years, motion capture involves recording the movements of a performer on to computer, so creating a completely authentic animation sequence. The videogame industry currently employs two disparate motion-capture methods: optical and magnetic. The former involves setting up a series of cameras around a performer who wears reflective balls on each important body joint. The cameras record the movement of the balls and then the artist takes this 2D data, identifies onscreen which balls relate to which body part, and so constructs a 3D model based on the movement. The data is then passed into an art package like *3D Studio Max* or *Alias*. Magnetic capture is similar, but covers the actor in magnetic sensors connected via cable to the PC which then records movement as a 3D image.

Magnetic attraction

Out of the two, it seems optical motion capture has emerged as the industry favourite. It gives the actors more freedom of movement, and there is no magnetic interference from nearby metallic objects. Companies like Gremlin, Psygnosis and EA have their own studios, and the technique has become an integral element of game design.

However, the system has not always proved ideal. As **Dave Warfield** at EA Sports points out:

'In the past, you had to wait days, even weeks to see if a move worked, and would have to do it by hand, or get the actors back in to re-film it if it hadn't.' These problems would have been caused by a combination of hardware and software deficiencies. Early motion capture setups could only use a limited number of cameras, and as three have to see each ball as it moves, certain sections of an actor's body would often be occluded – something which would have to be painstakingly corrected by an artist. The software, too, was rudimentary in the early days, taking hours to convert the 2D video data to a 3D model. However, those problems are now disappearing.

'There have been several advances,' asserts **Nick Bolton**. 'The scale of things is bigger. People are now capturing volumes of up to 11m whereas three years ago they were looking at 2m. Now, multiple actors are being captured so you can get all the interactions between characters. The technology has grown to meet these needs, so the Vicon system can now take up to 24 cameras, can capture for 24 hours and comes with enough markers to capture four actors. It's all got serious!'

Angus Fieldhouse, in charge of the Psygnosis motion-capture studio in Cheltenham has also noticed the benefits of new technology:

'Capturing multiple performers is certainly possible. This is particularly useful for prerendered sequences, as you get far better interaction from the performers. Furthermore, cameras are faster now so we can capture movement more accurately.' This is definitely a bonus: 120MHz capturing allows, say, beat 'em up moves to be caught with more precision than ever before, opening a wealth of possibilities to companies like Namco, Sega and Capcom.

New maturity

Motion-capture software has also become more sophisticated over the past year.

'It used to be that working with motion capture was a dull multistage process that required a great deal of user involvement,' says Nick Bolton, 'So we introduced pipeline processing about six months ago which automates the complete processing task. It enables the user to go all the way to cleaned-up, labelled data without any user interaction.'

This advance in speed is thanks partly to improved biomechanical modelling techniques in the motion-capture software. In the past, this software would look at the 2D video data and see only a randomly moving collection of dots (the markers on the actors body). Now, however, the designers are programming in an understanding of the human body, so the software knows the knee bone is connected to the thigh bone, etc. It can construct a 3D model based on the data – taking a massive workload off the artist.

Advances in biomechanical modelling are also opening up new avenues for game developers.

'Other areas we want to pursue include manipulating or mapping human movement on to more fantastic creatures,' says Fieldhouse. This could mean stretching the data to create giants, or cutting and pasting motion-captured limbs from creatures to produce hideous, mythical beasts.

Nick Bolton has a vision for the future:

'The Holy Grail of motion capture is markerless, realtime capture. This will improve the current way motion capture is used, but would open up the possibility of players actually being captured as part of the game. So you can be Lara or Crash and interact with other players in the game and physically interact in the capture space. It will be introduced to arcade applications first and will then move into the home. Such a form of capture is about two to three years away. Expect a whole range of motion-capture applications to explode at that point: it's going to be big.'

> 'The Holy Grail of motion capture is markerless, realtime capture, so you can be Lara and interact with other players in the game in the capture space' Nick Bolton, Vicon





Motion-capture data can add considerable realism to videogames – especially those based around diverse human movement. Both *Tekken 3* (left) and *ODT* (right) captured real fighters and stuntmen to make the ingame combat look totally authentic

The alternatives

Although motion capture is enjoying an increasingly tight grip on the videogame industry, not everyone is playing along. Edge takes a brief look at the alternatives

Skeletal Animation

The small US developer, Ritual, could not afford to incorporate motion capture into its forthcoming action adventure, *Sin*, so the company developed its own proprietary animation technique – simply as a plug-in for *3D Studio Max*. The skeletal animation system enables artists to create thousands of animations for each character with few overheads. It also allows for regional damage – which means when a character is shot in the shoulder, the damage only shows there – plus, the victim will reel backwards in the direction of the bullet; an advanced and compelling feature that looked marvellous in *GoldenEye*.

'We can also attach "bones" (models) such as guns or helmets to our characters at any time,' points out **Joe Salinske**, product manager on *Sin*. These can be employed on the fly by characters. As Salinske puts it, 'The bones system is cool. Let's say one guy is attacking you with a shotgun – if he runs out of ammo, he'll throw the shotgun aside and pull out a pistol. Shoot a guy in the head and you'll kill him in one shot. But, if he's wearing a helmet, it may deflect the damage altogether.' In effect, then, objects become a physical extension of the character. It's an ingenious concept.

Body Physics

Chris Hecker wouldn't touch motion capture with a barge pole (see p60). His burgeoning software company, Definition 6, is developing a complex character animation tool based heavily on physics. Hecker talked **Edge** through the basics:

'Our simulator supports constrained rigid bodies, which means you can take a body (call it



Ritual has used a 'skeletal animation technique' to create the character movement in its forthcoming shoot 'em up, *Sin*

the lower arm) and constrain it to another body (the upper arm) and set the type of joint between them. In this case you'd want what's called a "revolute joint", which is a fancy name for a joint that has only one rotational degree of freedom. In other words, a hinge or elbow. Now, once you've got this joint set up you turn on the simulator, and the forces propagate through this joint correctly, so if I pull on the wrist, the arm straightens out and then drags along after me. Basically, it acts like a real arm. You can build an entire model of a creature using bodies and joints, and if your simulator supports contact for constrained bodies – remember, if you're physically simulating things, the ground doesn't just magically work; your simulator has to actually compute the forces the ground exerts on the objects to keep them from sinking into it! – you can drop this creature and it will buckle and fall to the ground like a ragdoll. As an aside, these separate constrained bodies are just how the simulator sees the object; your renderer can skin between the bodies.

'Anyway, now the real hard part comes in: you have to write code for a controller that acts as the creature's muscles and makes it stand up and act like it's alive. If you go all the way you have to write a controller that will balance the creature, make it locomote, and make it do all the stuff it has to do in a game, like swing a sword without falling over, climb stairs, etc. It has to do all this stuff by exerting forces at its joints, because in a real simulator you can't simply move its body parts directly or the object won't interact with its environment correctly (which is why you see today's animation loop characters swing their arms through walls during their animations). You can't have an arm hit a wall or table or bad guy and bounce off correctly if you're not exerting forces on the arm like a real muscle.'

In some ways, this concentration on physics is the way the videogame industry is already heading in. However, it is doubtful many other companies will abandon motion capture altogether. Not only is the system a convenient way of getting animation put together quickly but it's also accurate.

Hecker's ideas represent the very forefront of game physics and may well filter down for use alongside motion capture in the future.



For *Grim Fandango*, LucasArts used hand animation rather than motion capture to complement the game's stylised look

Traditional Techniques

Do gamers actually need or want all characters to be realistic? By employing things like motion capture and complex physics, is the ultimate aim of all developers to get as close as possible to portraying real humans? Not necessarily. Konami, for example, threw away all of its motion capture data for the characters in *Metal Gear Solid* and went back to using key-frame animation – the aim being to capture the look of an anime movie and the cool, heavily stylised atmosphere of that genre.

Similarly, Manny in *Grim Fandango* is not a 'realistic' character and no motion capture was employed to animate him. Instead, the artists used hand-drawing throughout to give him a kind of filmic stop/go animation look – heavily inspired by the characters in Tim Burton's 'The Nightmare Before Christmas'. In both cases, realism wasn't the desired effect – the teams took their inspiration not from life, but from other art forms.

But this is no less valid than the quest for realism. With Manny, LucasArts is trying to create an engaging character, a character who – in his own twisted world – is believable and alive. Sonic wasn't a realistic being, but his impatient foot-tapping when the player left him stationary for too long was a particularly interesting addition to the platform genre – it gave the character a personality beyond slavish adherence to the joypad. **Tim Schafer** expresses this best:

'How "realistic" the characters appear is not really important. It's how compelling the character is, both visually and in terms of personality. If a big, cartoon-like face is the best tool for expressing the character, then that's what you should use. But some characters are done more service with subtlety and realism. The technique doesn't matter, it's how artfully it's used. I have no rules against realism, I just haven't found a use for it yet.'

Is this the future?

Beyond videogame development, spectacular advances are being made in the realms of human animation and design. But what exists at the very cusp of technology today, may well be behind tomorrow's ingame characters...

To understand what videogame characters will be like in the near future, the best place to look is current prerendered sequences and CG animations. Although it is almost inconceivable that ingame humans could soon rival the realism in, say, the *G-Police* FMV sequences, high-spec PCs are almost powerful enough to render this kind of thing in realtime.

Perhaps the most significant tools currently employed in CGI are NURBs, or Non-deformed Uniform Rational B-splines. NURBs are a different way of describing shapes than polygons; rather than using triangles as the basic modelling blocks, NURBs enable artists to create objects out of perfect, highly complex curves. This system, again used in the *G-Police* intro and supported in *Maya*, is commonly utilised in CGI sequences to build realistic human characters, but is at the moment too processor intensive for realtime use.

Face value

Another technique currently popular in CGI is facial motion capture. Twenty-eight tiny markers are positioned around the face of an actor and his or her facial movements are filmed and converted into a 3D face model. The technique is used both for emotional expressions, and for dialogue – in fact, **Angus Fieldhouse** at Psygnosis has talked about motion capturing an actor and recording their speech simultaneously to create almost perfect lip-synching. This would be a massive step forward for RPG and adventure games which include a lot of verbal communication between characters. At the moment, few games have attempted this as polygon models are far too low detail for the benefit to show but, as hardware becomes more powerful, the possibilities abound.

Further afield

Not all CGI advances are being made in the realms of the prerendered intro, of course. Computer animation is rapidly becoming an essential component of the movie industry, both in the field of special effects, and in its own right as an entertainment medium. Pixar has made huge progress in its own representation of humans since working on Disney's huge hit, 'Toy Story' (the company built its story around toys because they were easier to produce – they are meant to look plastic and unreal). Its latest short, 'Geri's Game', centres around an old man playing chess in the park and employs a new method of generating incredibly smooth surfaces. Named 'subdivision surfaces', it divides and subdivides the surface of an object, making it smoother and more complex, without the 'tears' which often appear between NURBs.


'Geri's Game', a new animated sequence by Pixar (of 'Toy Story' fame), uses complex human animation techniques

> 'If the person playing Lara says a word, the face of Lara will do the same. Her lips will move to form the word and her cheeks will pull down accordingly' Adrian Smith, Core

Television is also experimenting with CGI characters. Last year, a French TV station ran the series 'Planet Donkey Kong', which featured Rare's platform hero conversing with live presenters (see E45), and Core is developing a 'Virtual Lara Croft' to represent the heroine in TV appearances. The 55,000 poly model, constructed using SGI Indigo workstations and multiprocessor reality engines, was produced for a German videogame programme, but will appear worldwide. Core's **Adrian Smith** outlines how complex the 'entity' is:

'All the attributes regarding how she moves have to be built into the model, even to the extent that if 'Lara' says a word, then the face will do the same. For example, her lips will move to form the word and her cheeks will pull downwards accordingly. This is the same for muscletone – if we bend an arm, the correct muscles will flex.' Dynamic character animation rears its anatomically correct head once again.

Concepts such as these are out of reach as far as realtime gaming is concerned. However, Core is reputed to be working on a game that utilises some of the technology involved in 'Virtual Lara'.

Elsewhere, programmers are talking about using NURB-based characters in PC games and there are rumours that PlayStation 2 will support NURB modelling. As for facial motion capturing, companies like EA Sports, Shiny and Appeal are already experimenting with giving their ingame characters' realistic expressions. More human than human? One day, perhaps...




Alias|Wavefront's *Maya* art package is capable of producing incredibly realistic prerendered sequences, as these demos, put together by CGI luminaries such as Chris Landreth, testify. But *Maya* can also be used to create ingame characters

interactive. toys

Forget the desktop: the computer is a playpen and a new breed of software developers is stacking it full of toys. Are they the future of interactive entertainment?









Multimedia is currently shrugging off its 'bastard-son' status to re-emerge as a sophisticated media form. Certainly the old-school method of taking dull reference books and shovelling them onto digital media has justifiably snuffed it. But to some, the moribund industry is like a ruined church to children. Skipping through the ruins armed with cheap copies of *Shockwave* and *Director*, they've learned how to have a laugh with multimedia. The first generation of multimedia publishers got it all wrong, they giggle. Don't make CD-ROMs like books, make CD-ROMs like games.

Interactive toys aren't games, though. They're playthings. Interactive toys are about messing around.

Yet toys – which typically provide a smaller, briefer, more intimate experience than full-fledged games – also rarely tap into the kind of dosh that fuels the games industry. So how do such things get financed?

Many do it for free, for the pure pleasure of leaving a digital calling card on the Web for someone else to find. Some look to the corporate world for financing, and push their own creative boundaries while someone else pays for it. A very select few either release their creations as commercial products to a ready audience of aficionados, or have the cash from other sources to finance their new media experiments.

Aspiring art

At the very top of the interactive toy food chain, Peter Gabriel's company Real World Multimedia has the money to throw at monumental artistic new media projects like *Eve*, released in 1996, and the recently released interactive narrative, *Ceremony of Innocence* (see **E**60). Gabriel's own interest in artists and musicians, plus his massive fan base, has meant that Real World can produce curious, artsy semi-games and still find a ready audience. They also produce regular subscription-only enhanced CD-ROMs ▶

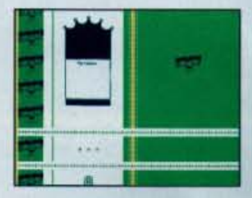


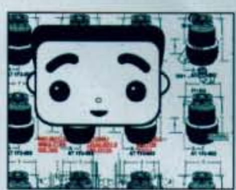




Real World's *Eve* (above) followed the path trodden by the first Peter Gabriel multimedia extravaganza, *Xplora*. One of the first interactive toys, it's hard to argue that two men city sitting in a urinal (right) is art – though many tried







Is it subversive, is it perverted or is it just a wind up? Regardless of whether its intentions are honourable, Superbad is an excellently unhinged place to spend an hour

filled with the work of Real World music artists and interactive toys.

Talk to a range of designers, producers and managers involved with the company, and a common thread emerges: they're all fed up with the generally dull state of the CD-ROM and online worlds and are looking for ways to redefine interactive space. Says **Alex Mayhew**, creative director for *Ceremony of Innocence* and current artist-in-residence at Createk, 'My interests are combining the kind of interaction of an arcade game with a human aesthetic – something that isn't computerised and pixillated – and placing that in an emotional and poetic context. I think there's a huge range to explore.'

Ceremony is an attempt to achieve emotional depth yet retains a sense of play – a narrative between two characters unfolds through a series of interactive postcards whose often humorous puzzles need to be unlocked before they flip and reveal the next line of the story. It's neither game nor interactive book, full of art, storytelling and music. Unusual, but guaranteed a significant audience because Real World can give it the profile a small design house never could.

But even highbrow toys with the Gabriel imprimatur have the same problem as more modest interactive offerings: the distribution chain. 'Retailers say, is this music or a computer game?' complains Real World multimedia and online manager **Lisa Howe**.

'Retailers say, is this music or a computer game?' complains Lisa Howe. 'There's got to be some kind of revolution in the retail chain.'

'There's got to be some kind of revolution in the retail chain.' In the meantime, like others, Real World is offering its products where interactive fans know to look: on its Website.

More straightforward musical offerings – audio CDs by artists who add in interactive, computer-accessible elements – are another form of musical toy, and have few distribution problems because they are offered with all



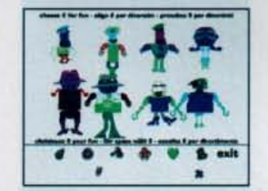


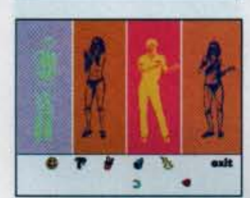


Peter Gabriel's latest CD-ROM, *Ceremony of Innocence*, includes stunning video art snippets and some nifty digital frippery

In new media at the moment, music is clearly the new Rock and Roll – many intriguing design houses are doing things with sound engines which makes for some great toys





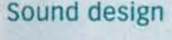


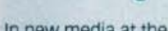
Antirom's work is ephemeral and irresistible. Toys mixing dance and sound (above) are favourites

the artist's other titles. Such offerings tend to fall into two camps – older rockers who don't understand interactivity, and newer, dance-influenced outfits who think computer code is as essential as musical notes.

An early tech-savvy adopter of enhanced CD is longtime musician **Tom Robinson**, a Mac and technology fiend who 'was appalled at the vast waste of space on the average CD.' In 1995, as he was producing his CD 'Having It Both Ways', friends at Canadian new media firm Datapanik suggested filling the space with multimedia. In went an eclectic mix of music loops, photos, text, video, interviews, and safe sex info.

The problem was that few people were that tech-ready. So now he prefers to put the interactive stuff on his Website. He also notes that Microsoft has shafted people who bought enhanced CDs in the mid-'90s, because *Windows 95* dropped the driver needed to play them. A patch which will work for all affected CDs can be downloaded at http://members.aol.com/panikcode/.

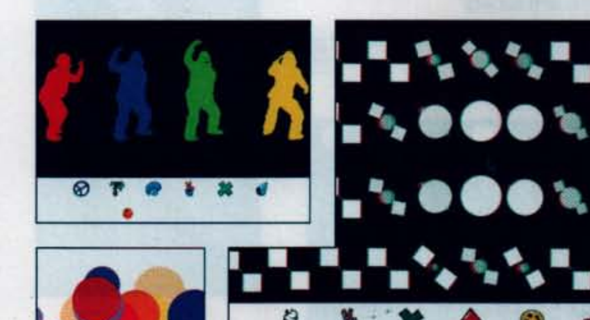




Sound design

In new media at the moment, music is clearly the new rock'n'roll – many of the most intriguing design houses, especially at the small and funky end of the market, are doing things with sound engines which makes for some great toys. Take Antirom, the quirky sound and vision crowd loosely affiliated with the much lauded London design house Tomato (of 'Trainspotting' fame). Antirom's 11-member, management-less cooperative ('Sometimes making a decision on a project is like 11 people going to the video shop for one video,' says **Tomas Roope**) creates CD-ROMs which closely knit sound samples, running on their own sound engine, to a range of click-and-play images. Where Antirom stands out is that it pairs the fun-with-sound approach to a witty, able, often stylishly retro graphics sense. And it has peddled the combination successfully to corporate clients.

Prior to the 3D-effect CD-ROM for Levi Strauss that came with the necessary specs, ▶



Antirom's mini-CD for Levi Strauss came with free 3D glasses to exploit the holographic effects (right). Dancing gorillas is unique, to say the least





Antirom's first sponsored project, *D-Code*, targeted youths about the dangers of drugs

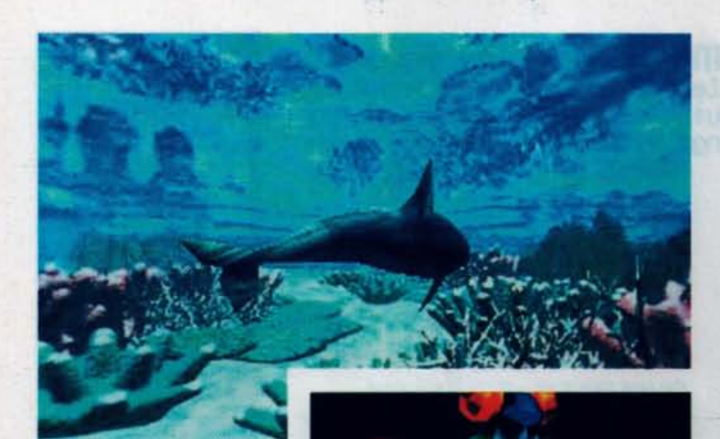
REAL WORLD

The chief toy man at Peter Gabriel's Real World Multimedia is former games designer **Joshua Portway** (above), who has designed a Mac music toy for Real World's upcoming release, Different Drum. 'I'm interested in the crossover between music and games,' he says, but likes aiming for the mainstream rather than the gaming audience. Still, he wants the intensity and immersion he gets from playing Defender, a total, intuitive mold with an interactive world 'where it's like someone's bolted another kind of body on to me.'

What he hates these days is interactive obesity. 'There's a kind of bloated perspective of all CD-ROMs,' he fumes. 'The aesthetic of CD-ROM and the aesthetic of rock opera – they're the same; they're both so overblown.' He is into smallness and toys, 'projects which take two months, not two years.' He's pleased with his Mac engine, which is used on the current Real World enhanced CD and will also be downloadable free from the Real World site.

For his next project he's planning an interactive album, which will combine pieces of music – he's already talking to interested musicians – and toys that let the CD user actively participate in the music and get beyond the human-computer interface. 'It's such a difficult and alienating thing to sit in front of a computer monitor,' he says. He'd like the user of his toys to merge fluidly with the onscreen experience: 'Something which feels like dancing.'





Fluid (above) and *Baby Universe* (right) are two recent Japanese releases for the PlayStation that fit the interactive toy mould. Sony's platform also produced *Parappa the Rapper* – a toy made good

◀ It created a nationally distributed free CD-ROM called *D-Code* for the National Drugs Helpline. Designed as a quiz game on drug use, it eventually awards players with access to a full 'sound arcade' or mixing desk, a prime example of active rather than passive entertainment.

Some of the best Websites to play around with are those connected to new media outfits working with sound. London-based AudioRom has a site full of small sound toys structured into its design. There are also downloadable sound and *Shock*ed files, as there are at Bath company Modified's site. Modified also sells its soundmix CD-ROMs there – download demos for a fun test run.

Despite hiring the talents of hot design studios, most commercial sites remain yawningly conservative and uncreative in their use of interactivity. And even the best company sites throw their own promotional material at Web users. That's why a mysterious site with no clear purpose deserves the final accolades. There's plenty of them out there, thrown together by Net geeks in their spare time, a digital labour of love. But the question still remains: why?

'I'd been doing Web stuff for work and decided to try my own to see how I could break the rules about designing Web pages,' says **Ben Benjamin**, the San Francisco-based designer of the site Superbad. The bizarre but brilliant site, heavily *Shock*ed with bits of *Java* thrown in for good measure, has been constructed over three years, he says.

Why is the site, which has nary a word of explanation for its existence anywhere, so... anonymous? 'I think it's more interesting if people don't know who's doing it; like it could have been done by a machine, or a lone nut in a garage, or a group of people, or a company with a really whacked-out mission,' he says. 'Superbad doesn't explain itself at all and doesn't really need to because it doesn't have any information anyone's trying to get.'

The online VR Pantheon, constructed in VRML by **Will Waller** and Tim Redfern at the Dublin Institute of Technology, is a shrine to 20th Century preoccupations – designed to experiment with multi-user environments and shared properties. Visitors can explore a number of 3D worlds, including one entirely dedicated to, who else, Elvis. It is this hybridisation of interactivity and interconnectivity that has revived the CD-ROM, as links to Websites open up greater flexibility and access to updated information. 'Cathedrals represented the ultimate in technology for their time,' explains Waller. 'Computers, in a way, now have that function in modern society.'

Thank God computers make pretty cool toys, too.





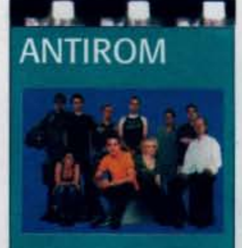
Antirom has connections with Tomato, a design house whose work (above) Edge would love to see spread to multimedia





Modern icons find a home at the VR Pantheon, produced by the Dublin Institute of Technology. Elvis finds a new role as a digital plaything (right)

ANTIROM



Into new media but lacking any formal geek background, the Antirom collective emerged three-and-a-half years ago and quickly entered into 'a mutually supportive relationship' with sharp and spiky London design house Tomato, says collective member **Tomas Roope** (no-one in Antirom has a differentiating job title). 'Most of us came out of film and photography degrees,' he notes, adding that 'you were abused for liking games in college, but we saw games were like a proper medium.' That insight propelled Antirom into exploring what might happen if good design was crossed with interactive technology in the non-gaming world. The result: some of the best-looking toys around, informed by playfulness and a quirky sense of humour.

Now they have 'four or five reasonable programmers,' pretty much self-taught, who have come up with the Antirom trademark music engines used in disks like *D-Code*, the Levi Strauss mini CD; work done with a range of musicians; and a small online exhibit in HotWired's RGB Gallery. So far it's relied on an initial Arts Council grant and commercial work to survive, but is moving into publishing (with a music engine product – they're into 'generative concepts of music,' says Roope). The Web, which hasn't featured strongly yet in Antirom's work, also beckons: 'The Internet is very boring, but has a lot of possibilities.' The problem is trying to remain new media rebels in a corporate world: 'There's progressively more pressure to put a suit on. What we try to do is value the process of making, rather than value the process of selling. Maybe that's foolish...'

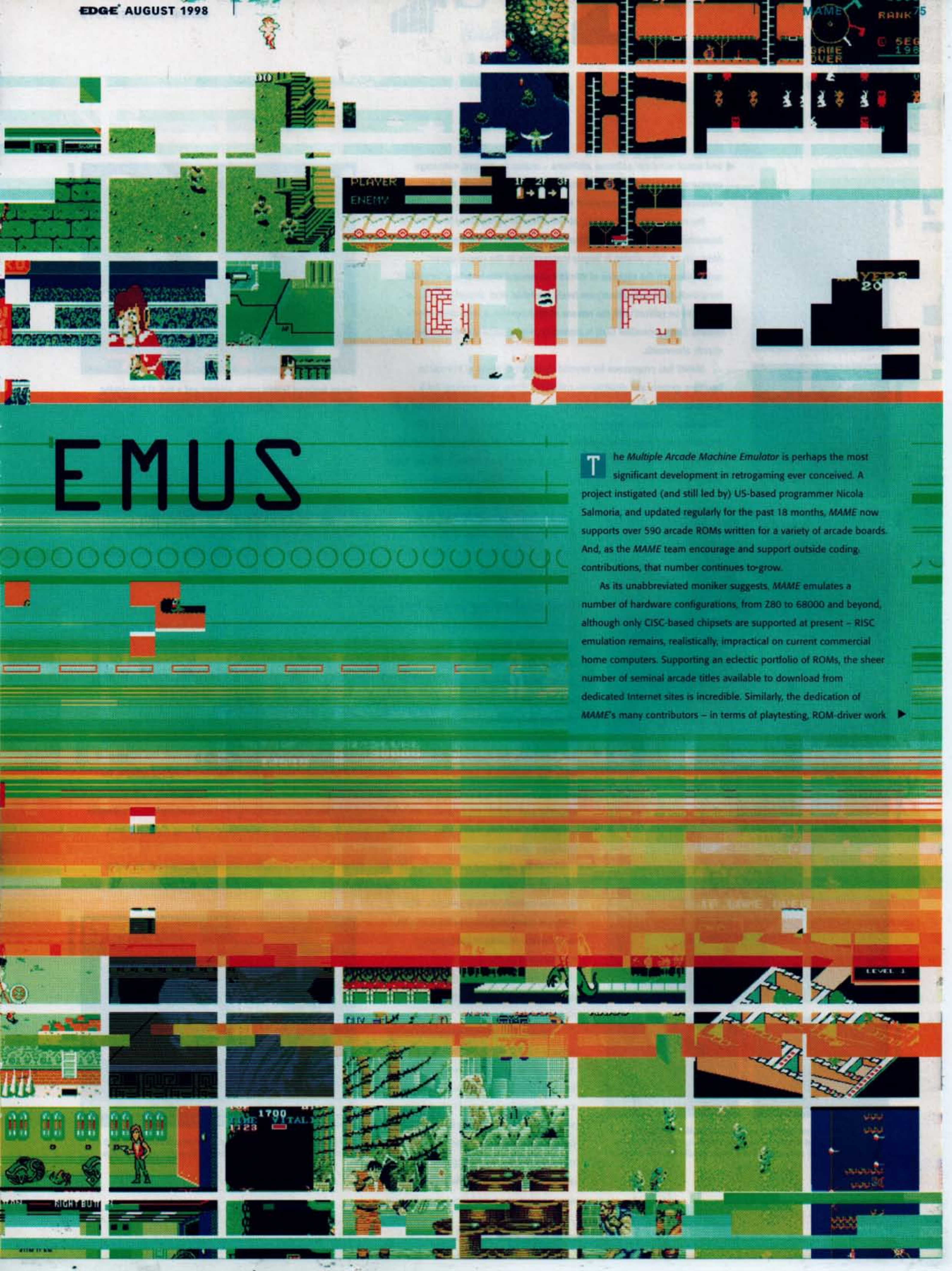
Internet links

Antirom: www.antirom.com
AudioRom: www.audiorom.com
Lateral Net Ltd: www.lateral.net
Modified: www.modified.com
Obsolete: www.obsolete.com (more links)
Real World: www.realworld.on.net
Superbad: www.superbad.com
Tom Robinson: www.tomrobinson.com
Tomato: www.tomato.com
VR Pantheon: pantheon.dmc.dit.ie



FIRST AMONG

It is seen by many users as the greatest piece of computer software ever written, yet it remains one of the most mysterious. Edge delves into the murky world of Multiple Arcade Machine Emulation...



EMUS

The *Multiple Arcade Machine Emulator* is perhaps the most significant development in retrogaming ever conceived. A project instigated (and still led by) US-based programmer Nicola Salmoria, and updated regularly for the past 18 months, *MAME* now supports over 590 arcade ROMs written for a variety of arcade boards. And, as the *MAME* team encourage and support outside coding contributions, that number continues to grow.

As its unabbreviated moniker suggests, *MAME* emulates a number of hardware configurations, from Z80 to 68000 and beyond, although only CISC-based chipsets are supported at present – RISC emulation remains, realistically, impractical on current commercial home computers. Supporting an eclectic portfolio of ROMs, the sheer number of seminal arcade titles available to download from dedicated Internet sites is incredible. Similarly, the dedication of *MAME*'s many contributors – in terms of playtesting, ROM-driver work ▶

PLAYER 1

Galaga

Bomb Jack

and actual emulator software additions – makes its Internet entourage comparable, and possibly larger than, the online community that so enhanced the longterm appeal of id's *Quake*.

For many dedicated gamers, *MAME* offers an opportunity to revisit old favourites, much as a movie enthusiast might collect Frank Capra classics. Although its DOS version is largely inaccessible to the casual gamer unfamiliar with the vagaries of *Win95*'s command line interface, simplified front-ends (and instructions) are freely available. And, should gamers be willing to be patient with the release of each update, a dedicated *Win95* release (with accessible GUI) is posted on newsgroups and dedicated sites shortly afterwards.

MAME has progressed far beyond the point of being of interest to hardcore gamers and desktop toy collectors alone. Disregarding, for a moment, the legal issues that surround the supply of ROM code, *MAME*'s list of supported software spans the interim between the beginning of the arcade industry up until as recently as 1990. While it's certainly not the case that *every* title developed during that period can or conceivably will be made available for *MAME*, many significant moments in videogame history *are*.



Rainbow Islands

Games featuring limited colour palettes and a lack of fast-moving images are quite obviously most suited to lower-specced PC users

It's during this era in particular that a huge number of gamers will have cut their teeth on the likes of *Galaga*, *Zaxxon* and *Bomb Jack*. And, while it's unlikely that many such 'veterans' will credit or even acknowledge Taito's *Phoenix* as being one of the first games to feature basic cinematic embellishments – it featured scrolling starfields, iris-like fills and 'wipes' between levels – such titles are, at the very least, of passing appeal. The videogame industry has a history that precious few sources can relate as well as *MAME*.

Double Dragon

Remembering a golden era

For the casual gamer, *MAME* provides a nostalgic voyage into what was, retroactively considered, a halcyon era of creativity for a fledgling marketplace. By today's conservative standards, the inventive, off-beat nature of many early arcade games appears an aberration, a far cry from the tightly focused and market-led design of modern equivalents – but, invariably, the appeal of older titles is brief for all but the die-hard. Beyond 1984, however, the number of titles that continue to offer a degree of lasting appeal increases. *New Zealand Story* and *Rainbow Islands*, for instance, are seminal platform games that retain the playability that justify their categorisation as 'classic'; *Gauntlet* and *Toobin'* are poignant reminders of Atari's days as a genuine industry heavyweight; Tecmo's *Double Dragon*, the thinking man's *Final Fight*, will be fondly remembered long after Core's *Fighting Force* has been (perhaps rightfully) forgotten.

> By today's conservative standards, the inventive nature of many early arcade games appears an aberration

For the dedicated retrogaming enthusiast, *MAME* is not the realisation of wildest dreams per se, but it comes close. As Salmoria's brainchild emulates the original PCB, it's possible to tweak and experiment with the operator controls of various ROMs. With Tehkan's *Bomb Jack*, for example, players can alter the tenacity of the pursuing mechanical bird, the number and speed of more generic assailants, and the appearance and frequency of coveted 'E' and 'S' coins.

MAME also offers the opportunity for users to fulfil long-held ambitions of playing certain arcade games to the very finish. Its dedicated cheat function works in a manner similar to that of commercial add-ons, like Datel's Action Replay, for consoles. By searching game code for certain registers and making note of alterations – like, say, the reduction of a



Star Wars



Gauntlet II



Marble Madness

Some of Atari's biggest coin-ops are available via *MAME*. Supporters of the cause go to great lengths to ensure authenticity: *Marble Madness* may not be trackball compatible, but it works excellently with a mouse

Final Fight

MAME originally started life emulating small-scale coin-ops such as *Galaxian*, but it has now progressed on to more ambitious titles



Ghouls 'n' Ghosts



Shinobi



Golden Axe


Strider

lives counter from one to zero – *MAME* allows users to experiment with such titles in a manner previously impossible.

The completist, too, is catered for. That *MAME* supports a version of *Ghosts 'n' Goblins* in which the last weapon is a cross rather than a shield will be of negligible interest to many, but a precious joy to a select few. In fact, a number of games supported by the emulator are available in different incarnations – bootleg versions, territory-specific releases and, in some instances, alternative versions of a game developed by another publisher. There's even support for 'cocktail' modes, where the video display is altered for use in a tabletop cabinet.

Although *MAME* runs exact copies of supported ROMs, the emulation of certain titles can be, at times, a measure short of the arcade perfection many would expect. This is due to each game requiring dedicated driver support. Pieces of software tailored to facilitate the communication between the relevant processor emulation code and the game itself, these are continually updated by supporters of *MAME*, with each revision improving the quality of the title in question.

As previous versions have demonstrated, games making their debut on the emulator are invariably flawed in some manner. From the 'usual suspects' that are poor, or offer no sound emulation and imprecise colour usage, to crash bugs on later levels, it's not just the *MAME* code itself that is constantly evolving. Version 0.31 sees *Zaxxon*, *Millipede* and *Shao-Lin's Road* boast improved colours, while *Gorf* offers better speech. In addition, *Punch Out* and *Donkey Kong 3* (in its day available exclusively to the Japanese market) have aural accompaniment for the first time, both being reliant on the sound hardware found in the Nintendo's NES console. Yet another interesting development is the improvement of clipping routines for vector graphics games, like the recently 'updated' *Battlezone* or the experimental nadir that is *Star Wars* – and, what's more, anti-aliasing support is included for both.

There are many, many other alterations and additions to drivers, of course, the number of which rather illustrates the enthusiasm with which the coding communities have embraced the *MAME* ideal. This can, largely, be explained by the simple desire of such otaku to see genuinely flawless emulation of their individual favourites. However, the contribution of the *MAME* team in making their source code and wisdom freely available is considerable. As the *Multiple Arcade Emulator* is programmed in C, each PC release can (and is) ported to Mac, Unix and even Amiga platforms. All that its development team ask in return is that those using the code share their discoveries and alterations.

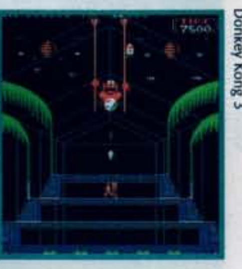
A legal minefield

The *MAME* team are, quite naturally, unwilling to discuss the legal implications of their emulator. With the entire emu scene existing within an unusual legal grey area at present, those involved in the project are keen to avoid publicity as a means of avoiding damaging litigation.

One individual close to the *MAME* project, however, felt compelled to discuss the issue with **Edge** but – understandably – was unwilling to be named. One of his comments in particular rang true: 'It's a pity that while the *MAME* team moans about emulator overviews that bitch about the copyright issues for people that don't own the boards (as I do) they can't be bothered to help somebody do it right.'

He argues that *MAME* has a legitimate use as an 'archive tool' for owners of original PCBs, a library program with the added bonus that the 'supported' games can be played. 'The reason why arcade ROMs were on the Net in the first place was for people who owned the arcade games


Commando


Donkey Kong 3


Kung Fu Master


Green Beret



Super Punch Out


Return of the Jedi





INTERNET RESOURCES

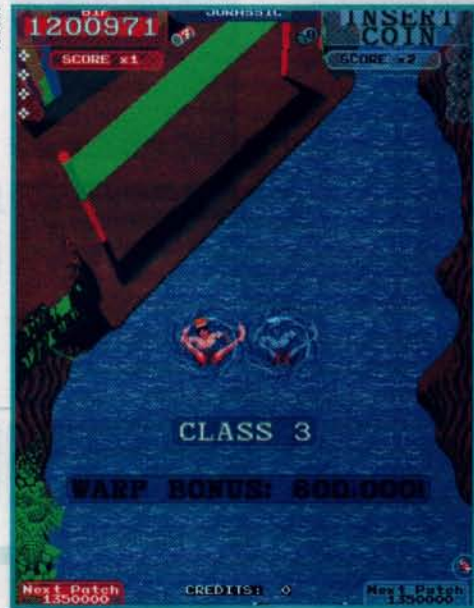
www.davesclassics.com
www.emuviews.com
www.crowmet.com/~no-sleep/newic/
www.media.dsi.unimi.it (official MAME page)
www.fortunecity.com
www.cyberramp.net
www.hardware.paimet.com



UN Squadron



Toobin'



Tiger Road



Shao-lin's Road



Fairly obscure oriental fighting games sit quite happily alongside more mainstream fare on the many Internet sites carrying *MAME* ROMs

Missile Command

Track 'n' Field



When emulating certain coin-ops via *MAME*, it's probably best not to opt for keyboard control in attempting to replicate the experience…

and needed to fix them,' he says. 'The use of ROMs by legal owners of the game hardware is 100 per cent legal. *MAME*'s intended purpose is to archive technical info for arcade games. Being able to play them is merely an added plus. This is why [the] *MAME* [team] has not bothered to create an ultra-slick user interface.'

The fact that the *Win95* version of *MAME* does feature a simple user interface, and front-ends are available for the DOS version – although, it must be said, the central *MAME* team have little or no involvement with the coding – rather renders the latter argument obsolete. Also, with the release of each new *MAME* beta, its accompanying 'What's New' document details compatibility with new ROMs and improvements in emulation standards – actual 'technical information', in the sense that **Edge**'s contact implies, is therefore often conspicuous by its absence.

Each new release of *MAME* boasts greater compatibility with existing coin-op titles, and is capable of supporting a handful of new ROM sets. Authors of drivers and improvements, and providers of sound samples, are given credit in the documents contained in the *MAME* download. So how, then, could the team argue that their emu is intended solely for the use of PCB owners, when the casual, game-hunting Web browser is so royally catered for?

Dave's Arcade Classics (www.davesclassics.com) is a highly regarded site that covers console, computer and arcade emulation. It is not in any sense *MAME*-specific, yet has arguably the best (and most reliable) collection of ROM sets available on the Net. It also allows users to download the latest *MAME* betas almost immediately upon their release. During **Edge**'s last visit to the site prior to finishing this article, 8,033,335 hits had been recorded on its web counter since its first day online. But, more astonishingly, the site's *MAME* download page – that is, a solitary page with versions of *MAME* alone – had a web counter total of 1,323,631 visitors since June 30, 1997.

Many sites feature warnings to the effect that ROM sets may only be downloaded if the individual owns the original arcade board

Other sites carrying the emulator, while not boasting such impressive visitor figures, certainly support speculation that *MAME* is fast becoming the largest piece of freeware gaming software in the world. Despite arguments to the contrary, the project is no longer the underground concern it once was. The mainstream beckons, yet remains elusively beyond the grasp of the project. The reason, as if it need be related, is simple: the legality of ROM-set supply and ownership.

Many sites (Dave's Arcade Classics included) feature warnings (or, rather, 'requests') to the effect that ROM sets may only be downloaded if the individual in question owns the arcade hardware, or for an evaluation period of generally 24 hours, after which players must delete the file or purchase the relevant PCB. Some go as far as to validate downloads for owners of retro compilations – the argument being that ownership of PlayStation *Williams Arcade Classics* validates possession of an accompanying *MAME* version.

Naturally, these and other such statements – in legal terms – are paper-thin, and could be challenged with ease by all but the most naive lawyer. And, with games from the early '90s now supported, *MAME* could soon become a victim of its own success.

With retrogaming compilations offering publishers reasonable returns, it's only a matter of time before the existence of *MAME* is perceived as a threat. Indeed, with the 'update' fast becoming a favourable publishing strategy, developers are becoming cautious with ageing legal properties.

Heavy Barrel



The future of emulation

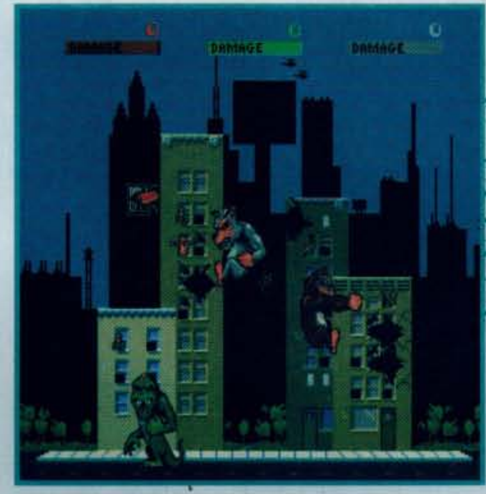
So what can the future hold for *MAME*? On one hand, its existence grants many forgotten classics a new life on a different platform, providing once-cutting-edge arcade software for the price of a download. It could be argued, however, and with equal validity from a publishing standpoint, that the *MAME* scene is one of the largest examples of organised piracy in the industry at present.

One option is an attempt to truly take *MAME* into the mainstream. Could manufacturers be persuaded to release older titles into the public domain? Software houses, like many businesses, are not known for their philanthropic tendencies, but perhaps older, inert titles could be made available? But such a route, too, could spell the end for the *MAME* project. Part of its huge appeal at present is the excitement of downloading a new update, before finding the new ROM images it supports. With its catalogue of supported games whittled down to the few that publishers are prepared to 'part' with, could it maintain its current level of success? Hardly.

Another (rather less likely) possibility is to make *MAME* a more commercial concern, with ROMs downloadable from approved sites for a modest fee, a proportion of which could go to the original copyright holder. 'I would love to see this,' says **Edge**'s source, 'but I don't think it will ever happen. Tracking down copyright holders for games where the original companies no longer exist, coupled with myriad legal issues, is an insurmountable task. But I would love to be proved wrong.' He is, however, concerned about *MAME* becoming a retail product. 'I think the best way to destroy *MAME* is to try and make money off it. With a few notable exceptions – such as Jeff Vavsour's original *Williams Arcade Classics* – the commercial emulation scene is littered with half-baked attempts to cash in on the nostalgia craze. With *MAME*, we listen to feedback until it is 100 per cent perfect. No Christmas holiday market deadlines. No pressure from those who care more about the bottom line than a quality product...'

Edge finds itself in the uncomfortable position that, while eager to champion the *MAME* cause, the legal issues surrounding the emulator and the ROM sets it supports are too significant to ignore. With this in mind, the opinions of both readers and software industry figures are welcomed: how can *MAME* continue in its current form? Are certain **Edge**-reading publishers prepared to authorise the use of arcade ROMs? Can (or should) *MAME* become a commercial concern?

And, with the likes of *720°*, *Ghouls 'n' Ghosts* and *Strider* now fully playable, how can **Edge** meet its print deadlines? Answers or speculation to Viewpoint at the usual address...


Rampage


Black Tiger


Iron Horse


RoboCop


Wonder Boy in Monster Land



Rastan Saga


Yie-Ar Kung Fu


Ninja Gaiden

The arcade scene of the '80s, dominated by non-dedicated cabinets running distinctive titles, is now thriving in the home thanks to *MAME*

OTHER PLATFORMS AND BEYOND...

As *MAME* is written in C, it can be ported to a number of platforms. Thus, Apple Macintosh versions are freely available, Amiga ports are commonplace and, for a select few, an Acorn-based *MAME* can be found. **Edge** has also heard of a Nintendo 64 conversion, based on CD and compatible with the controversial Doctor 64 'backup' peripheral – although this is badly optimised and barely manages a refresh rate of 10-20fps on even old titles.

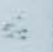
Of course, while such open architecture allows a greater number of people to enjoy *MAME*, it also limits the program's ability to cope with more complex chipsets. A P133, for example, can run the likes of *Galaxian*, *Pac-Man* or even *Rainbow Islands* at the frame rate their creators intended, yet struggles with the likes of *Dragon Ninja* or *Strider*. A P300 will, of course, offer markedly better performance, but there are ROM sets appearing at present that will pose problems for all but the most seriously overclocked home PC.

That *MAME*'s growth is limited by advances in home hardware is obvious, but rumours of a PC version written in assembly language could help the program offer better emulation to a larger potential audience. Such an advance will become essential if *MAME* is to make the leap from CISC-only emulation to supporting more complex RISC chipsets – something current *MAME* fans can only dream of.


Dragon Ninja


Strider





TESTSCREEN

The definitive monthly assessment of the world's latest videogames

Fair game

Since the beginning of the interactive entertainment age, magazine review scores have been the subject of continuous contention, dispute and the occasional death threat. And even after an editorial team has agreed on a score, it risks facing the same fusillade from software publishers.

The current, rather disheartening state of affairs sees nearly all videogame publications rate games on an artificially restricted scale, where a game receiving 70 per cent or its decimal equivalent is considered an average title, of little or no interest to most players. In other words, rather than use the whole of the scale, which may seem a radically logical approach, most magazines are essentially only using half, or at most, just two-thirds of it.

Edge evaluates games on a scale of ten, where five naturally represents the middle value. Perhaps shockingly, then, a game receiving a 'seven out of ten' is in fact a competent title with noticeable flaws, but which should still appeal to a considerable range of players and naturally more so to those who favour the title's particular genre. It does, after all, score two points above average and should therefore not be considered as such.

Sadly, with the vast majority of videogame publications failing to treat 50 per cent or five out of ten as the mid-point, the industry has slowly but surely grown up erroneously regarding a game scoring 70 as a dismissible, substandard experience.

This has more serious repercussions than a succession of enraged PR personnel spouting profanities from the relative safety of the end of a phoneline. Older players may have had the benefit of several years to select a publication whose scores they concur with regularly, but with a whole new generation appearing on the videogaming scene and the ever-growing number of magazines 'specialising' in videogames (each claiming to be the definitive word in their respective field, yet consistently failing to correctly assess the games contained within its pages), new readers are likely to rapidly lose faith in the publications that are there to supposedly serve them.

Of course, reviewing is rarely a totally objective activity but even a little consistency is de rigeur, and the current lack of this crucial element within the majority of videogame magazines is unlikely to alleviate matters.

Edge's rating system may seem harsh, but it is fair, progressive and balanced. An average game deserves an average mark and not, as some may think, seven out of ten.







From left: *Army Men* and *Tommi Mäkinen Rally* – substandard titles likely to be labelled as such by magazines awarding them 70-odd per cent. And *Yoshi's Story*, Edge's interpretation of a perfect 'seven'

Videogames on the Edge

The games – old, new, whatever – that have grabbed **Edge**'s attention this month



GoldenEye (Nintendo)
Yet another appearance for Rare's masterpiece as an **Edge** staffer finally reaches the game's extra levels, nearly a year after its **E48** testscreen.



Time Crisis 2 (Namco)
Hours have been spent putting this teamplay game through its paces. Enemies falling to bullets from an unseen partner definitely ups the pace.



Blast Corps (Nintendo)
It's a Rare month as **Edge** gets strategical while revisiting the Twycross-based company's explosively entertaining, first original N64 venture.



Ghouls 'n' Ghosts (MAME)
Researching this month's *MAME* feature brought Capcom's seminal horror platformer back to life. Unforgiving, but so amazingly atmospheric.

Index

BANJO-KAZOOIE



Rare is back, displaying its consummate technical mastery of the N64. *Banjo-Kazooie* throws a (very) harsh light over the efforts of other developers, including the big Nintendo itself. Locations are vast, colourful and detailed











As seen in *Donkey Kong Country*, the development team seems to have had more fun designing the bad guys (top, second). Cauldrons act as teleports (above)

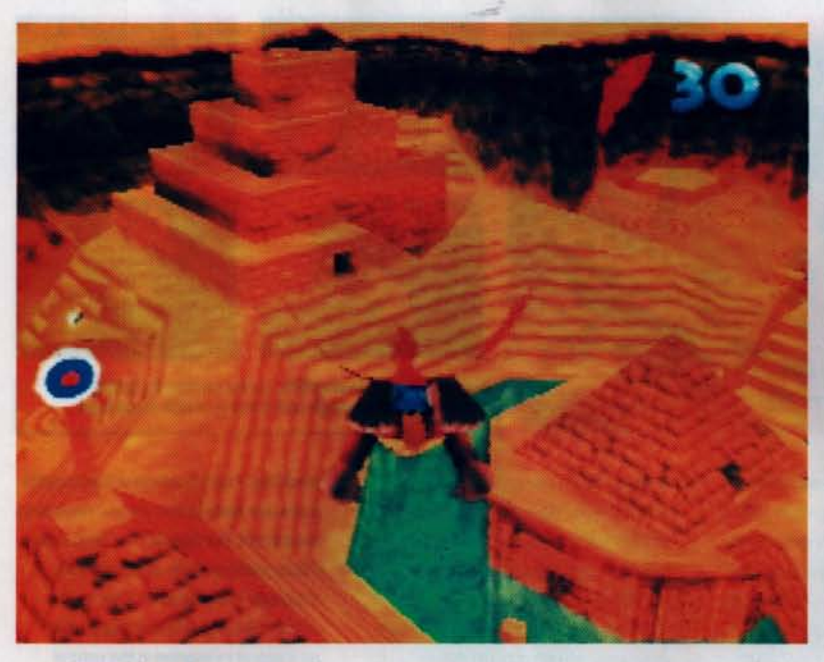
From its auspicious beginnings with *Super Mario 64*, the evolution of the thirdperson 3D platform game can be plotted as a downward curve. Such was the standard of Nintendo's launch title (which doubtless benefited from its protracted development period), those that have followed have seemed little more than pale imitations. Even Nintendo's design guru Shigeru Miyamoto is struggling to match the quality of his masterpiece. Rare, however, has scored the nearest miss yet with *Banjo-Kazooie*.

The game follows the joint adventure of a bear (Banjo) and the bird that inhabits his backpack (Kazooie). The plot takes shape as Banjo's little sister Tootie is abducted by the evil witch Gruntilda, who is intent on stealing Tootie's good looks for herself – Banjo and Kazooie are destined to rescue her. Unfortunately, such a childlike ensemble of characters and story will do little for the N64's image as a toy, particularly among 'blood and guts' gamers. It's not to the game's detriment, however, although the characterisation is perhaps a little predictable. As ever, Rare's 'baddies' are far better realised than its 'goodies'.

Key members of the team responsible for *Donkey Kong Country* formed the core of *Banjo-Kazooie*'s crew. Aside from a similar animal-based collection of characters, clear parallels can be drawn between *DKC* and *Banjo*. From the sprawling hub level (Gruntilda's Lair) to the animals that can be utilised (or in this case, morphed into to open up more area for exploration), echoes of the older title run throughout the team's new game. Many of the ideas have been better integrated this time around, although the concept of two controllable



Freezeezy Peak is one of *Banjo-Kazooie*'s best worlds, both visually and in terms of gameplay. Looking down from its highest point can be dizzying



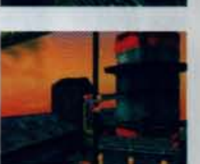
Once learned from the myopic mole Bottles, Kazooie's flying ability becomes a welcome alternative to running around













While mind-numbingly cute in style, the game's soundtrack is a fine demonstration of interactive audio, with music blending between areas

Format: **N64**

Publisher: **Nintendo**

Developer: **Rareware**

Price: **£50**

Release: **Out now**

characters could have been far better explored. Jon Ritman's 8bit classic *Head Over Heels* featured separate characters, with distinct abilities, that could be joined to access new areas. But such innovative touches are sadly lacking in the permanently connected Rare characters.

However, by tying the dual heroes so closely together, Rare has allowed a wide variety of moves to be included in the game. They're not all available from the outset, though – the player has to learn new actions from the friendly mole Bottles, who emerges from his hills at selected points. As expected, this then facilitates access to new areas of the game. Even with over a dozen obtainable standard moves, the control system remains commendably intuitive. Every move is beautifully animated, though the *Mario*-style high jump (hold down the Z trigger and press A) is of particular note.

In addition to guiding Banjo and Kazooie, the player must also make full use of the game's camera in order to progress. Rare has tried to accommodate all tastes, with both a zoom and rotate control, and a 'chase cam' which tracks behind the character. While the system works well on surface sections, the many underwater sequences are marred by the sudden switch to a fixed camera position. On occasions this proves intensely frustrating, with Banjo and Kazooie regularly drowning while trying to retrieve one of the many collectables, because the player can't see the action.

The core of *Banjo-Kazooie*'s gameplay is, in traditional platform game style, built around gathering a number of items. Chief among these are the notes and jigsaw pieces that unlock the game's later levels. Scattered throughout the central hub world are points where jigsaw blocks garnered from each of the worlds are used to unlock the entrances to further stages. Additionally, there are various 'note doors' placed strategically throughout, each marked with the number of notes that must be collected to pass into fresh areas. This approach forces the player to scour each world for the maximum possible number of both items, rather than the more leisurely, open adventuring of *Super Mario 64*. Other collectables include Gumbo skulls, ▶













Changing into the various creatures via Mumbo isn't always a success (above)











Kazooie's invulnerability move comes in handy at times (main), though not always when expected









To unlock new worlds, players must use jigsaw pieces to complete the puzzles scattered around the hub world (top, second). Doors 'sparkle' open (above)

which the player can trade with Mumbo the shaman (one of the game's strongest characters). Mumbo will transform Banjo into an animal, and it is these creatures that are *Banjo-Kazooie*'s strongest facet, with good design and fairly novel implementation. Sadly, not every stage has a Mumbo hut, while the time spent morphed seems over all too soon.

Puzzles in the game rely too heavily on the player's physical dexterity rather than their mental agility. Players are asked to guide Banjo from A to B, with the only obstacle to progress being the narrow ledge between. None of the stages match the intricate layout of *Mario 64*'s Wet/Dry World, although some (such as the snow-bound Freezeezy Peak), stand out among the nine areas. The visual theme of each world, be it sand, swamp, ice or haunted and industrial, has limited the game's conundrums, not enhanced them.

A reluctance to experiment with environments, allowing gravity to defeat imagination, runs like a stream through this game. *Banjo* may outpace *Mario*'s visuals with a loping ease, but – sadly – the former game's mechanics are a pale imitation of Miyamoto's old master.

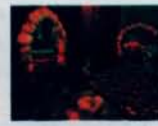
While unable to match *Super Mario 64*, *Banjo-Kazooie* leaves the numerous PlayStation 3D platformers floundering in its wake. There's no doubt that Rare has constructed a towering technical achievement with this title. Just as *Donkey Kong Country* redefined the limits of 16bit console visuals, so *Banjo-Kazooie* does for the current generation of machines. Fresh faces on the videogame scene are likely to find *Banjo* a rewarding investment. But beneath the good looks this is platforming-by-numbers, with the player channelled through a tight script that is brought into sharp relief by a lack of innovation in the control system and gameplay. Rare's title relies on the proven formulas of yesterday – not daring to be different – an unavoidable factor which will leave videogame cognoscenti wondering what all the fuss is about.

Edge rating:

Eight out of ten









Throughout the game, information about Gruntilda must be learnt, which serves to win a novel 'gameshow', one of its best features, near the end

COLIN McRAE RALLY



Successfully navigating *McRae*'s tortuous tracks requires maximum commitment and a skillful approach



Track locations are spread across the globe, from Sweden (top right) to Indonesia (right). The wide variance between stages is commendable









Between stages, the player must set up the car for those that follow (top). *CMR* caters for all tastes with its multiple twoplayer modes, including special stages

Prior to the well-documented excellence of *Gran Turismo*, the premier position among car racing titles was occupied by a British contender. Codemasters' *TOCA: Touring Car* (eight out of ten, E53) meshed PC racing sim handling with a strong console-style structure, delivering the best of both to PC and PlayStation owners. It recreated a popular motorsport to far better effect than Psygnosis' *F1*, and performed remarkably well in retail for what was in some regards a specialist title.

Now Codemasters is back with *TOCA*'s spiritual sequel, *Colin McRae Rally*. Based (obviously) around the racing exploits of British rally ace McRae, the game utilises the bare bones of *TOCA*'s graphic engine as its basis. However, where past rally titles have been less than literal in their interpretation of the sport, *CMR* is for real. *Screamer Rally*, *V-Rally* and *Sega Rally* all place the player in the midst of a racing pack, fighting for places against human or virtual opponents. *CMR* is a pure rallying simulation, with only one car on the track at a time, struggling to beat the other competitors' times.

However, in order to keep the action from straying into the realms of dull time trials, Codemasters has implemented a novel system which constantly tracks the player's position, comparing it to that of other drivers. It's a neat touch, keeping the action tense throughout each stage. When mistakes are made, the sense of anticipation as the next time check approaches is fantastic, eliciting self-deprecating curses on arrival.

As in *TOCA*, successful progress is rewarded with a variety of added vehicles. Eschewing its predecessor's tank and Cadillac, *CMR* delivers a comprehensive selection of past rally cars. (Preferring not to spoil too much of the fun – although other publications will



Completing the rally school unlocks the 'expert' setting. It's a testing experience









Format: **PlayStation**

Publisher: **Codemasters**

Developer: **In-house**

Price: **£45**

Release: **Out now**



Defeating all comers on special looped stages rewards the player with new cars, such as the Lancia Delta (top)



One of the few niggles with *CMR* is that the cars don't quite 'weigh' enough, causing extended crash sequences. Jumps are effective, though











Top to bottom: the five views of *Colin McRae*; distant, close (Edge's favoured angle), in-car, over bonnet, and the highly demanding driving seat option

undoubtedly fall at that hurdle – **Edge** will only reveal that Lancia's Delta Integrale is among those to be found.) These extras are gained by racing head-to-head on a looped special stage, with first place garnering the reward. Additionally, the full gamut of rallies cannot be accessed until the player has defeated each one in the game's full 'championship' mode. It's exactly this type of reward structure that PC racers such as *Ultim@te Race Pro* (six out of ten, **E**56) lack, much to their detriment. The imminent *Windows 95* version of *CMR* will fill a much larger gap than it has to on the PlayStation.

While *Colin McRae Rally*'s ordered progression is welcome, any driving title is only worthy of a podium place if it conveys a realistic handling feel to the player. Codemasters has not reneged in this area. *CMR*'s licensed cars are imbued with a driving feel that surpasses those of the past hero of this genre, *Sega Rally*. It could be argued that *CMR*'s external views don't deliver quite the raw, seat-of-the-pants feel of Sega's racer, but it's a marginal call. Played with Sony's Analog Pad, Codemasters' game provides a steady stream of reflex-testing moments, demanding total concentration. McRae himself was called in to assess the cars' handling, while members of the development team tried out rally cars for real. *CMR*'s realistic feel ranks alongside that of Nintendo's sublime *1080° Snowboarding*, and brings about the same desire to replay stages to perfection.

Blessed with over 50 tracks, a reasonable two-player mode, watchable *Gran Turismo*-style replays and its fine handling, *CMR* provides the ultimate in rallying reproduction. It is more simulation than arcade title, such is the level of its authenticity. There are occasional chinks in the armour, including a sometimes-reluctant handbrake and graphical glitches, and a stronger engine and exhaust note would have been welcome. But these are not enough to detract from the fact that *Colin McRae Rally* is the most comprehensive – and playable – game of its genre seen to date.

Edge rating:

Nine out of ten

SENTINEL RETURNS

Format: **PC/PlayStation**

Publisher: **Psygnosis**

Developer: **No Name Games**

Price: **£40**

Release: **Out now**









Multiplayer *Sentinel Returns* (above) is disappointing, being too frantic



Although the Sentinels and Sentries are presented in an abstract graphical style, up close it's easy to see which way they are facing







***Sentinel Returns* seems almost too simple. The square grid landscape might have been improved but the weird textured background is distracting**

When Geoff Crammond created *Sentinel* back in 1986, his ethereal strategy game, fashioned out of an aborted tank sim engine, was like nothing before. A game as simple as chess, yet one which couldn't have been created without computers, *Sentinel* enthralled a generation of archetypal thinking men.

Apart from a couple of critical changes, *Sentinel Returns* plays like its forebear. The player begins at the lowest point of a convoluted, tree-dotted landscape, while at the highest point on the map is the Sentinel. Both player and Sentinel can absorb energy from any objects at a lower elevation. The player can turn this energy into robots or boulders. Robots enable the player to move around the map, by teleporting from one to another. Through boulders, the player can place robots at a higher elevation, and work up the terrain.

The Sentinel is rooted to the ground and can only turn its death-dealing gaze in discrete, timed steps. If he spots anything other than trees (including the player) he drains its energy. To kill it, then, the player must absorb this energy from the highest point in the landscape. The 600-odd levels get harder through the addition of extra Sentinels, clever positioning and faster turning rates.

The original *Sentinel* constructed deeply involving, claustrophobic levels from plain coloured graphics. *Sentinel Returns*, featuring Gieger-esque polygonal graphics and a haunting John Carpenter score, largely recreates the same sensation. However, in the original, the player rotated in timed steps, like the Sentinel. Now, with mouse support, the player can turn and escape the Sentinel's gaze much more quickly, which partially alleviates the original's ability to cause panic.

The other main innovation is a multiplayer option, which **Edge** found to be a dispiriting experience. Players are so powerful in comparison to the Sentinels that the only viable strategy seems to be to recklessly build in order to negate the other player first. Who wins often comes down to who starts in the best position.

Like *Tetris*, *Sentinel* remains a singular game with a unique appeal. Yet just as players might expect more than *Tetris* on their games systems these days, they might well feel the same about *Sentinel Returns*.

Edge rating:

Seven out of ten

QUEST 64









Graphically inspired in many areas, *Quest 64* nevertheless fails to captivate due to underdeveloped gameplay

The game follows the familiar outdoor-indoor format of most RPGs, and presents some particularly attractive interiors (above right)

Format: **N64**

Publisher: **THQ**

Developer: **Imagineer**

Price: **$55 (£35)**

Release: **Out now (US)**

[Game supplied by Department1 contact 0171 916 8440]





There are many shops to visit (above) but, oddly, nothing to purchase. Collecting items is merely a matter of talking to the right people

Considering the languid state of the Japanese N64 market, and having the privilege of being the machine's first 'turn-based' RPG, it comes as something of a surprise to find *Quest 64* (née *Holy Magic Century Eletale*) making its initial appearance on Western shores. Whether US publisher THQ felt it simply couldn't wait while developer Imagineer extended the game's considerable development period is open to debate. But videogame economics and the impending arrival of *Zelda* would suggest that someone, somewhere, decided to get the game on to shelves as soon as possible.

Despite some interesting aspects, *Quest 64* appears to be a rushed and incomplete product. While Imagineer has produced a competent and asthetically pleasing 3D world and some interesting battle mechanics, all the other roleplaying trappings that players have come to expect are suspiciously absent.

A few screens of introductory text is all the game proffers by way of plot, and an absence of cinematics leaves the unfurling tale of an apprentice magician and his search for his father left in the hands of conversations with characters en route. Alas, it's hard to see how any sort of storyline could really help, anyway. The game quickly falls into a pattern whereby each town visited has a problem that needs to be dealt with before the player can continue. This invariably involves an arduous levelling-up process and constant combat until the player is strong enough to encounter the bosses of each town.

In reality, the battles are the only actual gameplay on offer. While their structure is similar to Square's much-lauded *Parasite Eve*, in that the player is given an area to freely move around during combat potentially avoiding enemy attacks, in practice it fails to work half as well. The game tends to freeze characters until an attack is launched, so when executing a quick camera cut, it's all but impossible to see where you should move to avoid damage.

It's easy to see *Quest*'s potential as the first console RPG to marry a turn-based system with a full 3D world. But with no puzzles to solve or secrets to discover (bar a few treasure chests), the actual roleplaying aspect becomes pretty much redundant. Just because *Quest 64* is available now and *Zelda* isn't, does not make it an essential purchase, and it remains a missed opportunity.

Edge rating:

Five out of ten





Battle sequences involve simplistic turn-based combat

BREATH OF FIRE III

Format: **PlayStation**

Publisher: **Capcom**

Developer: **In-house**

Price: **£45**

Release: **August**







While the 3D isometric backdrops are a step forward for the series, their simple, building block construction can create a Lego-like appearance to the levels



Story-advancing cinematics, be they rendered or hand-drawn, are non-existent in *Breath Of Fire III*. Any plot advances are acted out using the ingame graphics

Battles are traditional turn-based affairs, although some feature unlikely adversaries

Things don't immediately look good for the latest in Capcom's only RPG series. In its move up from the 16bit SNES, *Breath of Fire III* has gained a *Final Fantasy Tactics*-style, polygon landscape and plenty of colourful special effects; but to the majority of PlayStation owners, weaned on photorealistic SquareSoft renders, its brightly coloured environments and cartoonish characters will seem like a step backwards. Coupled with a storyline that immediately falls into the oversubscribed category of 'lone, heroic youngster, last of his race, can he fulfil his destiny and overcome the terrible evil?' *BoF III* seems doomed to a life of role-playing clichés before it's begun.

Despite a slow start, the game does eventually begin to show its one true strength: attention to detail. The characters have retained special abilities that only manifest themselves when they are leading the party. Players who remember the original fishing and town-building subgames will also find them here. But looking deeper reveals smaller, less obvious additions that give the game an added life. The player is able to cross a previously conquered section of land without having to worry about intruding battles, and town inhabitants now have more than one reply to questions. Setting up camp even enables players to cut away to the campsite to glean hints from their team mates on what the next move should be.

Alas, with little in the way of strategy, random battles are an RPG staple to be endured here. Combat is acted out without switching to a separate battle screen, resulting in small and unimpressive enemy graphics, while the 'auto-fight' feature goes someway to underlining just how tedious this aspect of the game can get.

Against the odds *BoF III* does exude some charm, but it's unlikely to win any new converts to the RPG cause. While it's clear that its creators have strived to take the best from the previous titles and improve upon it, many will find that the frequency of the random battles and long levelling-up process needed to proceed quickly wears their patience thin. Without some fresh approaches to the console RPG it can only be a matter of time until the fuse ignited by *Final Fantasy VII* fizzles out, and the genre reverts to its old, die-hard status. As such *Breath of Fire III* can only be recommended to those gamers who see themselves as members of that particular group.

Edge rating:

Six out of ten



Investigating a '?' can reap rewards, but at the expense of plenty of battles

X-COM: INTERCEPTOR



Here the player is approaching an alien processing plant in an X-COM fighter. The speedy deep-space combat sections are simple, but effective

Format: **PC**

Publisher: **Microprose**

Developer: **In-house**

Price: **£40**

Release: **Out now**

Taking something of a gamble with its *X-COM* brand, the latest retro-styled science-fiction title in the series ditches the wargame elements that made its predecessors so popular. Instead, it's a 3D deep-space shoot 'em up game engine bolted on to the familiar empire-building structure, with players controlling the X-COM team as they attempt to offer protection to humans in an area known as the Frontier. An area rich in mineral resources, green-skinned extra terrestrials and pirates threaten to steal the valuable deposits.

Navigating the main game menus involves turning '50s-style dials, looking at scanners shaped like portholes, and clicking on over-sized buttons. Such playful presentation helps to take the sting out of an outstandingly complex strategy section. Starting a campaign with just one X-COM base, a handful of fighters and little knowledge about what lies beyond the immediate area, the idea is to build up a comprehensive defence network. Probes must be dispatched to widen the sensor net, research carried out to provide improved technology, and fleets amassed, ready to strike when an enemy fleet is spotted. And all the while the aliens are readying a Doomsday masterplan that must be thwarted.

At this level, it's a familiar formula of resource management. Limited funds must be used wisely, new pilots recruited, craft equipped and restocked, and more cash earned by successfully providing protection to the outposts and ore processing plants in the Frontier. But as with previous *X-COM* games, the actual confrontations play a major part in all this, drastically affecting the plot, the strength, power and usefulness of the outfit, and also the research abilities. Salvage alien technology and it can be used to further the player's own.

The fighting element is integrated successfully, with players selecting whether to jump into the cockpit of a fighter, and taking direct action alongside wingmen. Although spartan, the 3D graphics reinforce that glorious retro feel, with alien craft bathed in red and green lights, and often taking the form of classically designed flying saucers. The combat is frantic, with craft zipping past the cockpit at an alarming pace, much as in *X-Wing Vs Tie Fighter*. In fact, those familiar with LucasArts' space opera will feel right at home here, so similar are both the flight and fight elements. It is worth noting, though, that those more concerned with the arcade side of things will probably find *Conflict Freespace* (see p96) a more compelling option.

The shift away from wargaming may well enrage dedicated *X-COM* fans. But in doing so, Microprose has managed the previously impossible task of blending real strategy with 3D space combat. Both elements have been well developed, with a game of enormous depth and instant gratification the happy result. If only all sequels could demonstrate such invention.

The enemy craft designs (above) will be familiar to alleged abductees everywhere







Each X-COM base can be modified (top), to provide more hangar space and defences. A handy UFO-pedia with essential alien info is also on hand (above)

Edge rating:

Eight out of ten

HEART OF DARKNESS

Format: **PlayStation**

Publisher: **Infogrames**

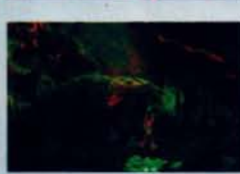
Developer: **Amazing Studio**

Price: **£40**

Release: **Out now**







Once the player begins an action, its animation must run to completion. This alone results in countless deaths



The fiddly nature of *Heart of Darkness* can render features like this lava pit infuriating. Such challenges are overcome by learning a sequence







In this sequence the player actually appears inside a giant's stomach

In a videogaming world still obsessed with 3D, older gamers will instantly view the 2D perspective and sprite-based action in *Heart of Darkness* with melancholic fondness. Every level boasts beautifully animated characters parading in front of gorgeous, highly detailed and imaginative backgrounds.

However, the plot – as set by an opening FMV sequence of unprecedented length – would have benefited from a little more creativity; after spending another school day daydreaming, Andy and his canine companion, Whisky, rush towards the park in the hope of getting there before the forecasted solar eclipse takes place, blissfully unaware that the next few moments will change their lives forever. With little warning, Andy's quad-legged friend is kidnapped by the evil Forces of Darkness, prompting his master to attempt a daring rescue through eight levels set in a strange and menacing parallel dimension.

While the narrative has an improbable chance of winning an Oscar, the game is equally unlikely to trouble the award-bestowing community because sadly, *Heart of Darkness* is not very good. Criticism cannot be levelled at its 2D perspective – *Abe's Oddysee* proved that as long as the right gameplay elements are present, the experience can be as immersive as some of its polygon-driven counterparts. Unfortunately, in its quest to produce a cartoon-like title, Amazing Studio seems to have ignored the crucial aspect of playability.

Infinite lives sees the proceedings rapidly degenerate into a trivial process of trial and error, with substantial FMV interruptions that not even a quirky end gimmick can hope to save. Some of the puzzles are competently thought out but never brain-taxing and once completed, there is no incentive to go back.

It may have spent the best part of six years in development, yet *Heart of Darkness* emerges as a flawed and deeply frustrating experience.

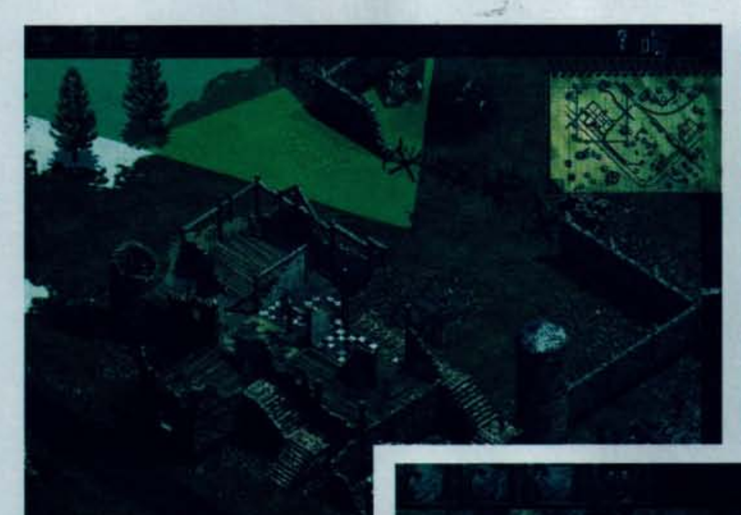


The background environments change from level to level, but sadly the basic gameplay doesn't

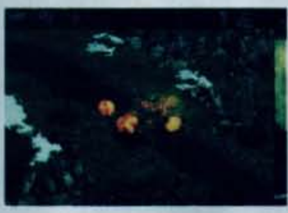
Edge rating:

Four out of ten

COMMANDOS BEHIND ENEMY LINES







Format: **PC**

Publisher: **Eidos**

Developer: **Pyro Studios**

Price: **£40**

Release: **Out now**









It's possible to observe each characters' moves concurrently (above), while the line-of-sight routines are well handled, adding much to the gameplay

The geography of the levels might not be wholly convincing, but the situations facing players present new challenges

While attempting to cross the river in an inflatable dinghy, a passing gunboat opens fire (top right). The enemy makes use of several vehicles, though the footsoldiers provide the greatest threat (above)

Of all the exponents of the new unit-based wargame genre to arrive so far, *Commandos* is the first to really capture the essence of the idea, featuring a design that leaves as much room for strategy as it does realtime excitement, and a control system able to cope with the demands of both.

Graphically the game seems to belong to another era, with hand-drawn mugshots and landscape graphics evoking the 'Commando' comic books of childhood.

But *Commandos* is happy to follow its own internal wargame logic, and use familiar imagery, situations and exploits to evoke the spirit of World War II. Scuba gear, patrol boats, cable cars, road blocks and other staples of countless Hollywood movies all loom large. There's even a spy character, able to infiltrate enemy compounds unquestioned. It all creates a terrific sense of atmosphere, despite the obvious lack of realism.

Yet, when it comes to the abilities of the characters, and their interaction with the enemy, *Commandos* is at great pains to do things by the book. Line of sight figures strongly here, with visible cone overlays revealing what the enemy can 'see', two distinct areas indicating what can be seen fully, and what is only visible when above ground level (making it safe to crawl). The enemy is also programmed to hear events, and so the destruction of military gear often results in utter chaos.

Commandos successfully addresses the tricky problem of placing up to six characters under player control by providing the option to split the screen up in a variety of ways. The movements of each are displayed in separate windows, each of which can be zoomed in or out, and even switched to track the movements of another character (friend or foe). It can sometimes be confusing, but ultimately proves hugely entertaining. Much like the game as a whole, in fact.

Ironically, however, it's the combat that blots the game's copybook. Attacks often happen too fast for the player to respond – the point-and-click system proving to be inefficient. But it's not long before the need for stealth becomes obvious, direct confrontation often arising only as a last resort. The action may be realtime, but the tactics needed reveal it to be a complex wargame.

Edge rating:

Seven out of ten

TESTSCREEN ROUND UP

Wargames

As expected, the connection with the 1980s movie of the same name is tenuous at best, but *Wargames* is more interesting for its re-working of familiar realtime strategy themes, tying in unit-based control and fully 3D landscapes with the simplicity and tight mission structure so beloved of console titles.

Not unlike *Return Fire,* rather than opting for indirect control of the units, players can switch between and take direct control of the various land, sea and air forces in the game, playing for NORAD or the WOPR computer forces.

Visually *Wargames* is too cartoonish, although as the levels progress the lay of the land affects strategies to a greater degree. Later missions – there are 30 singleplayer levels in all – introduce more unit types and improved firepower. Multiplayer issues have been well addressed, with two deathmatch modes, capture the flag and cooperative missions, while all views use an enterprising, diagonally split screen.

If there's a problem here, it's that everything is just a little too tidy and punctual. Calling in airstrikes and hack computers adds colour, but missions end too abruptly. Nevertheless, *Wargames'* blend of direct, arcade-style unit control proves surprisingly successful. Edge hopes the ideas showcased here are explored further.

Edge rating:

Seven out of ten



Format: **PlayStation** Publisher: **Electronic Arts/MGM Interactive** Developer: **Interactive Studios** Price: **£40** Release: **Out now**

Final Fantasy VII

Despite its mythic status, a PC conversion of *Final Fantasy VII* was far from certain. Bar *Resident Evil* and the recent run of Sega titles, it's hard to think of many great Japanese console games that have made it to the realms of the PC.

Happily, *FFVII* survives the transition unscathed. Despite all the PC developers obsessed with creating stories, narrative-driven adventures are actually becoming rarer on the platform. Players may take a while to appreciate the Japanese take on RPGs, but once they become involved in the unfolding drama they won't look back.

The only downside is that the ported graphics suffer on a monitor, in comparison to other PC games. The stylised 3D characters works well enough, but the backdrops, which seemed so wonderful in console form, look a little fuzzy on the PC. **Edge** can't help feeling it's a lazy – if economical – method of porting the game. Nevertheless, *Final Fantasy VII* is definitely a vital purchase for adventurous PC owners.

Edge rating:

Nine out of ten



Format: **PC** Publisher: **Eidos** Developer: **SquareSoft** Price: **£40** Release: **Out now**

Conflict Freespace: The Great War



The last few months has been a time of refinement rather than innovation for PC gaming, with titles such as *Unreal* and *Forsaken* building upon proven genres, demonstrating an impressive dedication to both graphical and gameplay techniques, rather than innovation. So it goes with *Conflict Freespace*, in theory an offshoot of the venerable *Descent* series, but actually a bang up-to-date re-interpretation of the space opera genre made popular by *Wing Commander*.

The visuals are, predictably, the first noticeable improvement, with both software and 3D card-based modes lending the game an understated majesty. This isn't a title awash with lens flare and harsh lighting tricks, but the detail lavished on the spacecraft and their various states of destruction is peerless. Best of all, there's a fluidity to the game that brings out the best in the physics engine – every dogfight possesses grace and subtlety. Good AI for both wingmen and enemy craft, along with strong plotting for each mission further enhances the simulation-like feel, the battles possessing a truly epic quality.

Of course there's nothing going on here that hasn't been tried before. But with its sensible approach to multiplayer (a dedicated online server is provided for Internet gamers), faultless look and feel, and a refreshing lack of FMV, *Conflict Freespace* makes a dependable entrance into a sometimes disappointing genre. Recommended.

Edge rating:

Seven out of ten

Format: **PC** Publisher: **Interplay** Developer: **Volition** Price: **£40** Release: **Out now**

Viper

The 3D shoot 'em up genre is one that has strangely been left mostly untouched by the PlayStation, as developers opt for the commercial assurance of racing, thirdperson adventure and 3D platform titles, with a resulting high proportion of depressingly mediocre software.

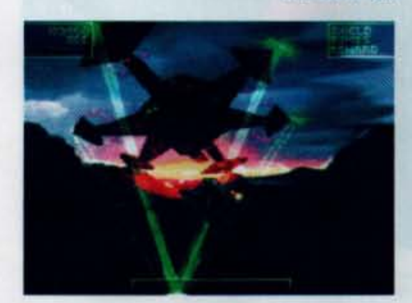
***Viper*, then, comes as a relatively refreshing addition. Players control a futuristic helicopter and must fight their way single-handedly through levels housing high numbers of cyborg-controlled warcraft. Thankfully, there is plenty to help this suicidal mission, mainly in the form of weapon power-ups and energy pick-ups.**

Visually, Neon's touch is as evident as in *Tunnel B1*, with colourful and effective lighting effects dominating the relentless onscreen action. The levels, too, although occasionally structurally simple, have a fairly solid feel and offer an occasional opportunity to select one of two routes, either of which eventually lead to a rather uninspiring end-of-level boss.

Disappointingly, there is little in terms of innovation, Neon having opted for a rather traditional and safe approach. Repetitive blasting through 14 similarly structured levels assures that what little enjoyment might have initially existed rapidly degenerates into tediousness. However, anyone desperate for an alternative to the usual PS suspects might find it agreeable in short doses.

Edge rating:

Six out of ten



Format: **PlayStation** Publisher: **Infogrames** Developer: **Neon** Price: **£40** Release: **Out now**

Nightmare Creatures

Like Eidos' *Deathtrap Dungeon*, Kalisto's horror-laden title uses a thirdperson viewpoint and dynamic camera system to portray the action-based adventure. This time it's the fighting element that's pushed to the fore, with each lead character – Ignatius the monk or the sword-wielding Nadia – possessing an array of moves comparable to those found in true beat 'em ups. Combos and secret moves feature strongly, as the pair seek out devil worshipper Adam Crowley in Victorian London.

This odd blend of horror and combat works well, the ability to decapitate and generally dismember the various undead creatures unleashed by Crowley proving most satisfying. However, the adventure element is thin at best, the 16 levels serving as a backdrop to the combat more than anything. And, while the creatures are impressive, possessing suitably unnatural styles of movement (limping zombies, for example), there aren't enough to prevent battle fatigue setting in. The developer has also failed to make the game's own event clock independent of the processor, resulting in a game that's unplayable on a P350 or above.

Nightmare Creatures is arguably a little too simplistic for PC gaming tastes. But then that hasn't done *Resident Evil* any harm.

Edge rating:

Seven out of ten



Format: **PC** Publisher: **Activision** Developer: **Kalisto** Price: **£30** Release: **Out now**

Xi

It's unfortunate that traditionally (with the exception of *Tetris*), puzzle titles sell very few units, because occasionally one comes along deserving more than the limited attention span it's guaranteed to get from the gaming public. Developers, of course, know this hence the relatively minute proportion of puzzlers currently available on the market. An ironic situation, considering the lifespan offered by a randomly generated puzzling environment is such that players have a tendency to return to it months after finishing the likes of *Tomb Raider*, for example.

In Japan, things are significantly different and it's not uncommon or surprising to see titles such as SCEI's *IQ* doing particularly well upon release. *Xi*, the latest brain-taxing venture to emerge from one of Sony's internal development teams, is sure to better its predecessor, and continues the company's devotion to producing innovative titles.

Stemming from a stupefyingly simple concept, *Xi* has players running around a board comprising 64 squares on top of dice, and moving them around with the aim of matching the top side and thus eliminating them from play. The number displayed determines the number of dice needed before their sinking-into-the-board act takes place. While this is occurring, players wishing to obtain bonus points have a limited time to 'tag' as many extra dice onto the descending group as long as the top faces match the ones disappearing. Highly impressive combinations and point scoring results.

In addition to the oneplayer game, single individuals can occupy themselves with the 100-level puzzle option while more people offer the opportunity to engage in the twoplayer cooperative or competitive modes, and a Multitap opens up the fiveplayer war game.

While not the new *Tetris*, *Xi* is a wonderfully playable, compelling experience whose varied modes further extend an already considerably healthy lifespan.

Edge rating:

Eight out of ten



Format: **PlayStation** Publisher: **SCEI** Developer: **In-house** Price: **¥5,800 (£30)** Release: **Out now (Japan)**

Tommi Mäkinen Rally



There are really very few reasons to buy *Tommi Mäkinen Rally*. With its realistic approach, Codemasters' *Colin McRae Rally* may offer a somewhat different experience, yet given the nature of both titles comparisons are nevertheless inevitable. And those wishing something more akin to Europress' title can still purchase a copy of *V-Rally*, safe in the knowledge that Infogrames' ageing effort remains a superior game.

***Mäkinen*'s car dynamics are distressingly inferior to those found in Codemasters' inspired title. While on the track, the vehicles' bodywork fails to pitch and roll, resulting in a very convincing floating effect and very unconvincing handling characteristics. There is also little sense of speed, other than in firstperson perspective. Often, cars seem to be crawling along at little more than 30mph despite the fact that the speedometer is rapidly approaching the 90mph mark.**

The game does offer a commendable number of tracks, yet sadly, very few of them prove particularly well designed. Thankfully, a comprehensive track editor is available for those wishing to create something more testing, but this alone cannot save the game.

Edge rating:

Four out of ten

Format: **PlayStation** Publisher: **Europress** Developer: **Strange Productions** Price: **£40** Release: **Out now**

MDK

Following E60's update on the state of Mac gaming, it seems apposite that one of the better PC conversions should be reviewed this issue.

Originally created by Shiny Entertainment, *MDK* immerses the player in a stylish, future earth scenario. Controlling a black clad anti-hero, Kurt, players are committed to full-on action from the start. After the game commences with him plummeting head-first towards the earth, *MDK* is, essentially, a 3D platform shooting game. However, there is decent gameplay variety, aided in no small part by being able to switch to a zoom-in sniper mode. This enables Kurt to launch mortars toward previously untouchable foes, and to pick others off from a great distance. He's also gifted with a beautifully fashioned parachute, constructed of four hoops.

Technically, Mac *MDK* for Apple is a creditable piece of work. **Edge** tested the game on 604e and G3 processors, both of which delivered a more than acceptable frame rate. As with many PC-to-Macintosh conversions, the only drawback is that *MDK* has been seen elsewhere – a long time ago.

Edge rating:

Eight out of ten



Format: **Macintosh** Publisher: **Anco** Developer: **Shokwave** Price: **£30** Release: **Out now**

Jikkyou World Soccer: World Cup France '98

Due to a Japan-only licensing deal, this import release is in fact the second official game of the 1998 World Cup competition (following Electronic Arts' effort – see E60). More importantly, though, is the fact that it is the sequel to *International Superstar Soccer 64*, Konami's benchmark football title. This factor, almost by default, makes it a storming sports simulation. Working on a time-honoured principle, Konami hasn't changed what is a proven core game engine, and hardened *ISS64* players will immediately feel at home with its successor. The control format is nearly identical, the only tweaks of real significance being mid-air challenges, a new defensive clearance, an alternative method of swerving the ball, and elevation arrows to complement directional arrows during dead-ball situations.

So gameplay in general remains largely unchanged in this follow-up, the through-ball manoeuvre proving just as important a part of successful play as previously, and the variety of attacking and goal-scoring styles as inspirationally implemented, too.

Improvements in *Jikkyou World Soccer '98* are largely aesthetic, then. Matches are accompanied by referees and their assistants, new celebration animations follow goals, and a number of superfluous touches, such as stretcher-bearers appearing for injured players, complete the package.

In audio terms, the Japanese commentary is admirably comprehensive, going so far as to include a handful of real player names such as Simione – an aspect that will not appear in the Western version in September.

Overall, a slightly underdeveloped sequel, but still a beautiful game.

Edge rating:

Nine out of ten



Format: **N64** Publisher: **Konami** Developer: **In-house (Major A)** Price: **¥7,800 (£40)** Release: **Out now (Japan)** [Game supplied by Department1 contact 0171 916 8440]



DEVELOP

Charting videogame creation today, for tomorrow

Beyond polygons

One of the major issues facing game developers currently working on the next generation of rendering engines is that of scalability. In a fast-moving market with a wide range of machine configurations and performance, it's difficult to know just where the line between speed and detail should be drawn.

Current graphics engines are almost all based around polygon technology, where 3D objects are represented by a series of flat surfaces. These surfaces are easy to design, calculate and display, as only the corner points need to be considered. However, polygon models suffer one major drawback – once a model has been designed, it contains a set number of polygons, and hence requires a certain minimum amount of time to calculate and draw, no matter how much of it is visible onscreen.

This leads to the case where a model which is a large distance away from the viewer, and is in fact only a few pixels high onscreen, is still being calculated and drawn at its initial detail level, slowing the engine down massively. There have traditionally been two solutions to this problem – distance clipping and detail reduction.

Distance clipping is simply the process of reducing the number of objects to be drawn by removing any over a certain distance from the viewer. This is fast and simple, but can get annoying for players, who then find objects 'popping up' in front of them.

Detail reduction is the preferred approach, and relies on having several copies of the same model, each designed with a different number of polygons. Then, when the model is close to the viewer, a high-detail version is used, and when the model is further away, the engine switches to a lower-detail version. This approach works well, but requires extra effort in designing the models and, more importantly, if the switching points for the models are not carefully chosen, the changeover may be noticeable.

Due to these problems, some developers are now looking at the possibility of a detail reduction system where rather than forcing the designer to create the different models, the game is able to decide how many polygons it can handle (based on the processor load at that time), plus how many polygons will be visible, and generate a model with that number of polygons by itself, based on a single high-detail design.

The key to this approach is to stop representing the original model with polygons at all, instead using a format that contains information about the structure of the model (usually in the form of curves, as most high-detail models are for characters, which are essentially curved objects), which can then be easily converted into polygons at a set detail level. One solution which has existed for some time is known as NURBs (Non-Uniform Rational B-splines), and is used by many popular modelling packages such as *3D Studio*, as well as being supported by OpenGL. The screenshots below show an example of a landscape rendered as a NURBs surface at both high and low detail. However, NURBs systems require very complex mathematics, and are not generally suitable for realtime game graphics. As a result, developers are starting to work on their own systems, based around similar concepts but optimised for fast, realtime use.

Among the developers working on this technology is Shiny Entertainment, whose current project *Messiah* already uses a system like this, and John Carmack, who is said to be working on a realtime detail control scheme for *Quake 3*.

Chances are, it won't be long before hardware accelerators catch up with this technology, and the next generation of game engines may run at the same frame rate no matter what configuration they are running on.

• Next month's issue will carry an in-depth report on revolutionary graphic techniques poised to bury polygons, the current staple of 3D game engines

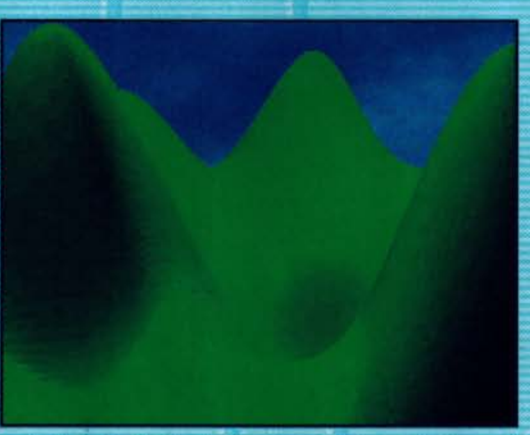






***Messiah*'s 3D engine exploits both deformation (which changes the shape of models) and realtime tessellation, which alters the number of polygons in 3D models**





Using high and low detail NURBs systems is a popular technique, though it's not suitable for producing realtime graphics

Edge moves

Programmers, artists, engineers, producers, animators, project managers – they're all essential to the industry, and they all read **Edge**. The following 20 pages carry a phenomenal variety of jobs for graduates, professionals and any other interested parties who think they could make it in the videogame scene. Apply within...

CHOICE CUTS FROM THE VIDEOGAMING VAULT



720°

An early attempt by a software publisher to cash in on 'yoof culture', *720°* was also remarkable fun...







***720°*'s bright, clearly defined playfields are typical 16bit fare. These shots are from an early MAME version, hence the innacurate colour schemes**

Without doubt, *720°* is one of the more fascinating arcade games released during the late '80s. Though its gameplay had little in common with its real-life subject matter, strong branding and inspired aural accompaniment gave Atari's title a distinctive identity. Indeed, its soundtrack was considered so integral that tape-based 8bit conversions were supplied with the original arcade music on the reverse side – an odd and weirdly complete decision by publisher US Gold.

With an eclectic array of hazards to avoid – including a swarm of killer bees used to enforce time limit restrictions – *720°*'s marginally open-ended architecture rather encouraged exploration and experimentation. Atari's level design allowed players to visit each of four skate parks in the order they wished by a route of their choosing, with credit to buy better boards and protective equipment as a reward for noteworthy performances on each.

Performing tricks – the staple constituent of any *720°* session – was achieved by rotating a joystick, thus spinning the skateboard. And, although such stunts may seem shallow when set against achievements possible in, say, modern snowboarding sims such as *1080°*, Atari – at the time – felt compelled to include a warning for skateboarders, emphasising its wishes that players should not attempt such feats in real life, following concerns about the safety of the sport and several skatepark closures. Reports of skateboarders bombarding Atari switchboards with suggestions that the company avoid haemmorhaging cash by utilising internal restructuring and rationalisation techniques are, lamentably, fanciful nonsense...

An eccentric, eminently enjoyable piece of software history, *720°* has recently joined the growing list of games supported by MAME. It isn't playable at the time of going to press but, with driver updates appearing regularly, a fully working version should be available within weeks of **Edge** going to print.

Publisher: Atari	1988	No 29
Developer: In-house	Arcade	

Arcade Gears: Image Fight/X-Multiply

While shoot 'em up enthusiasts await Irem's *R-Type Delta*, Xing has re-released two lesser-known titles

X-Multiply was released soon after the phenomenal *R-Type*, but never really emerged from the shadow of *R-Type*'s success. Now, in the run up to Irem's return with *R-Type Delta*, Xing has converted the auxiliary *X-Multiply* and *Image Fight* from their original arcade format. Notably, *X-Multiply* retains the Irem signature that is the 'defensive' power-up. But, in a design twist more adventurous than the R9's famed spherical shield, *X-Multiply*'s craft can be fitted with an invulnerable mechanical arm which must be used to progress through waves of enemy attacks.

Though lacking *R-Type*'s visual finesse and impeccable level structure, *X-Multiply* is a fine example of Irem's considerable creative powers. *Image Fight*, meanwhile, is the older and less sophisticated of the two, though **Edge** is fond of the cannons that fire in the opposite direction to a player's movement, encouraging intelligent craft control.





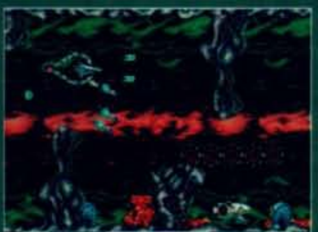


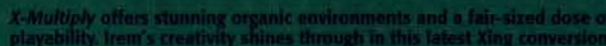


***Image Fight* is a diverting – if dated – experience, though its use of power-ups is, typically, excellent**









***X-Multiply* offers stunning organic environments and a fair-sized dose of playability. Irem's creativity shines through in this latest Xing conversion**

Format:	PlayStation/Saturn
Publisher:	Xing Entertainment
Developer:	Irem
Release:	Out now (Japan)
Origin:	Japan

STREET FIGHTER ALPHA 3

CAN BIGGER GRAPHICS AND BETTER MOVES JUSTIFY ANOTHER STREET FIGHTER INCARNATION?

Developer: Capcom
Release: TBA
Origin: Japan





***SF* favourites such as E Honda (top) and Blanka (above) make a welcome return in Capcom's latest**

While other developers attempt to design innovative coin-op concepts, Capcom seems happy to unveil yet more installments in its dragging beat 'em up series. *Street Fighter Alpha 3*, then, joins the other *SF* sequels currently circulating arcades, namely *SF III* and *SF EX 2*.

Some new faces have joined the tournament. Karin is a high-school girl character from a popular weekly manga publication, while R Mika is another female and the only original character.

Three modes of play are offered, the first two reflecting the fighting dynamics employed in *Super Street Fighter II X* and *SF Zero*, the third allowing players to string new combinations together and introducing a guard gauge, making it impossible for a character to block attacks after the indicator has been depleted. This requires players to adopt a more strategic approach.

However, even the promised two endings do little to disguise the absence of *Street Fighter Alpha 3*'s revolutionary features, opting instead for the tried-and-tested approach of its predecessors. As such, it's sure to delight fans of the series. **E**











As with every new *Street Fighter* sequel, the graphical overhaul is accompanied by new characters and a new fighting system featuring a bigger and more impressive repertoire of special moves

TECHNO DRIVE

NAMCO UNLEASHES A RATHER UNUSUAL TITLE UPON JAPANESE COIN-OP RACING ADDICTS

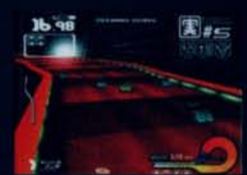
Developer: Namco
Release: Out now (Japan)
Origin: Japan











Although seemingly simple, the 15 levels take a while to master and prove very amusing

First announced at the AOU show last February, Namco's *Techno Drive* distinguishes itself from the hordes of driving coin-ops by being significantly different. And in order to reflect the game's title, Namco has opted for fluorescent colours and flat shading throughout the levels.

Set in the year 2305, with traffic problems escalated to unimaginable levels, paralysing every main road in Japan, driving ability has deteriorated to such a level that a machine is sent to the past as a way of re-educating drivers in order to solve the problems of the future.

Players thus engage in 15 mini-games designed to test and develop driving ability. These are divided into steering, footwork and practical techniques. The foot skill sections, for example, require no steering and 'drivers' must negotiate jumps and avoid moving obstacles by displaying power control ability and quick reaction times.

Each play allows the choice of three games, after which the machine physically prints out a rank of the player's ability, from A to E.

Overall, then, an intriguing title. ∈





Techno Drive's final stages require players to use all of their acquired skills to negotiate some fiendish tasks (above). The game's tiered levels (left) are no less tricky



Visually, *Techno Drive* represents a complete and drastic departure for Namco, whose previous arcade racing titles have included the comparatively serious approach of the firm's *Racer* series

Gallery

The art of the videogame

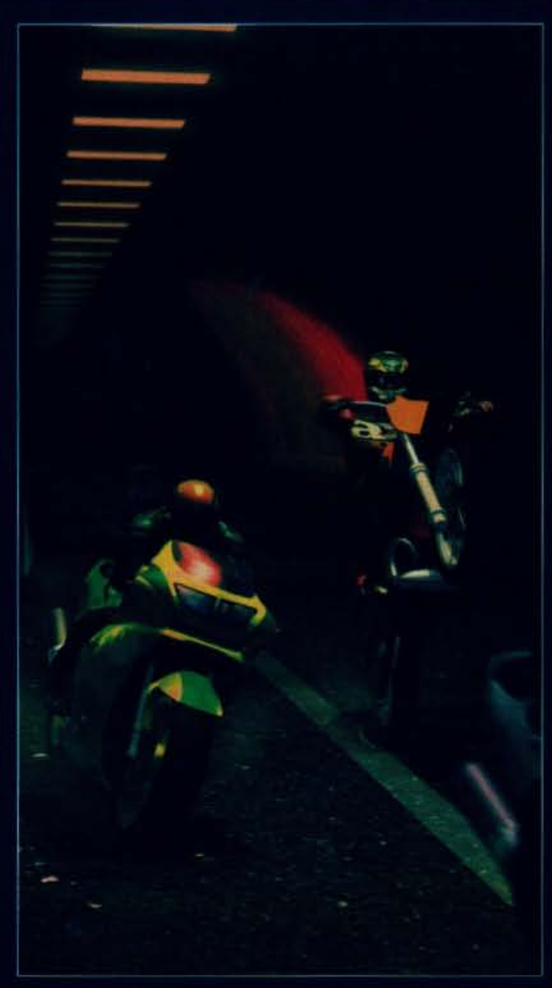




Moto Racer first impressed with its early use of 3D accelerator cards. Delphine's sequel presents more detailed hi-res backgrounds taking in environments as far flung as the Amazon basin. These images were actually created for the original, but publisher Electronic Arts is using them to promote *Moto Racer 2* (see p43), such is their quality.

Delphine

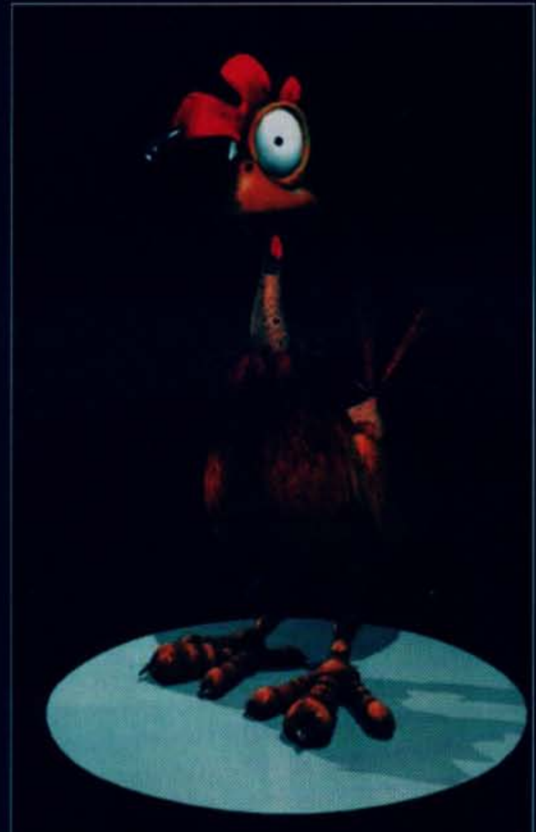










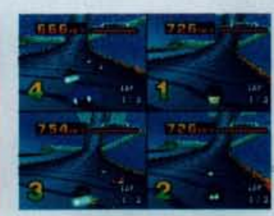






Mindful of the original's graphical mediocrity, Bullfrog has made *Dungeon Keeper II*'s visuals a priority. As well as replacing the ingame sprites with crisp polygons, the artists are making greater efforts with characterisation, which led them to out-source work to two Paris-based companies. Concept art was created by Slash, which won over Bullfrog with a genuine enthusiasm for the game. Modelling and rendering was tasked to Animare, which has previously created special effects for French television.

Images rendered using Softimage on Silicon Graphics equipment by Animare, Paris









THESE ARE DIFFICULT TIMES FOR NINTENDO. ITS 64BIT MACHINE REMAINS RELATIVELY UNPOPULAR IN ITS VALUABLE HOME TERRITORY AND FUTURE RELEASES, SUCH AS LEGEND OF ZELDA 64 AND THE 64DD PERIPHERAL, ARE SHROUDED BY UNCERTAINTY. CAN F-ZERO 64, THE SEQUEL TO NINTENDO'S FIRST REAL EXPERIMENT WITH 3D, GO SOME WAY TOWARDS REAFFIRMING GAMERS' FAITH IN THE WORLD'S BIGGEST VIDEOGAME BRAND? DISCOVER THE DEFINITIVE ANSWER NEXT MONTH.

ISSUE SIXTY-TWO

ON SALE AUGUST 11























TWO DOLLARS
TWO DOLLARS
A 21315217 A
WASHINGTON, D.C.
THIS NOTE IS A LEGAL TENDER AT ITS FACE VALUE FOR ALL DEBTS PUBLIC AND PRIVATE
A 21315217 A
EDGE
THE
UNITED STATES OF AMERICA
TWO DOLLARS



Voted Magazine of the year
1997 industry awards





